DCUCT

Design Document for “Designing Data Center Unified Computing Troubleshooting (DCUCT) v5.0”

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Document Purpose

The purpose of this document is to provide project personnel with the high-level information and design of the development project and specifications for the design of the course or learning product.

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Product Information

The *Data Center Unified Computing Troubleshooting* (DCUCT) v5.0 is a newly created 3-day instructor-led training (ILT) course designed to prepare system engineers, and implementers with the knowledge and hands-on experience to properly troubleshoot UCS B-Series and UCS C-Series servers operating in standalone and integrated modes.

The student will gain hands-on experience with proper configuration procedures and will become familiar with common troubleshooting scenarios and recommended solutions.

This design effort aims at:

- Linking the course structure to design based on building performance standards on job task analysis (JTA) claims
- Restructuring the content into a streamlined, logical fashion that reflects the current Cisco data center unified computing product portfolio feature set.
- Providing updated design guidelines for the technologies and products that are included

Project Description

List all project components, such as courses, exams, and other learning products here:

- ILT course
- Certification exam

Course Description

The *Data Center Unified Computing Troubleshooting* (DCUCT) v5.0 course is part of the curriculum path leading to the Cisco Certified Data Center Professional level certification.

- Development Project Name: DC Course Development
- Full Title of Course: Data Center Unified Computing Troubleshooting
- Course Acronym: DCUCT
- Course Version Number: 5.0
- New course: Yes
- Replaces: DCUCTS v 1.0 and DCUCSCTS v 1.0

Curricula

The course is used in the following curricula, certifications, specializations, and learning maps:

- Curricula, specializations, and learning maps:
  - Cisco Certified Data Center Professional

Delivery Types

The course will be delivered in the following learning modes:

- 3-day instructor-led (classroom or virtual) with labs

Deliverables

The materials and deliverables developed for the course are listed and described, including the percentage or hours of study and lecture materials, percentage or hours of practices (such as labs), and the total hours for a typical learner to complete the material.

- High Level Design Document (HLDD)

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- Detailed Design Document (DDD)
- Course Administration Guide (CAG)
- Instructor Slides—Microsoft PowerPoint presentations for standard 3-day ILT
- Student Guide—Microsoft Word documents for standard 3-day ILT
- Lab Guide—labs, demos, or case studies will cover approximately 50% of total ILT time

Target Audiences

The primary audience for this course is as follows:

- Data center designers, data center administrators, and system engineers

The secondary audience for this course is as follows:

- Data center engineers and managers

Target Theaters and Locales

This course applies to all theatres and will be developed in English language.

Prerequisite Skills and Knowledge

This section lists the skills and knowledge that learners must possess to benefit fully from the course. It includes recommended Cisco learning offerings that the learners may complete to benefit fully from this course.

The knowledge and skills that a learner must have before attending this course are as follows:

- Knowledge covered by the Introducing Cisco Data Center Networking (ICDCN) course
- Knowledge covered by the Introducing Cisco Data Center Technologies (ICDCT) course
- Implementing Cisco Data Center Unified Computing (DCUCI) course
- Server virtualization familiarity (for example, VMware vSphere, Microsoft Hyper-V)
- Operating system administration familiarity (for example, Linux and Windows)

Course Evaluation

Effectiveness of the course will be evaluated at these Levels of Kirkpatrick's performance evaluation.

- Level 1: Reaction to the course
  - Course effects: This assessment level gauges learner satisfaction, that is, feedback from participants regarding their levels of satisfaction with the offering. This assessment will consist of the Cisco standard program evaluation and will be completed by the learner.
  - Course evaluation: Required (via MTM)
- Level 2: Learning retained
  - Course effects: This assessment level tests for learner achievement following a portion, or all, of an instructional offering. The strategy for learner assessment calls for the use of written tests in support of the instructional program. Written tests will be administered in accordance with L@C standards through proctored certification exams. This assessment will consist of the laboratory exercises and the Cisco certification exam.
  - Course evaluation: Required

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- Level 3: Performance changes after the course
  - Course effects: N/A
  - Course evaluation: N/A
- Level 4: Results on the job, after the course
  - Course effects: N/A
  - Course evaluation: N/A

Assessment Strategy

This section specifies the assessment approach for the learning product.

- Module-level self-check quizzes integrated into the course (with equal distribution of all types of questions, from recall- to evaluation-level)
- Lab activities with verification and answer key sections
- The DCUCT 5.0 exam

Maintenance and Core- or Theater-Specific Requirements

All content needs to be evaluated with respect to the changes required due to product updates. Since the Cisco UCS software is rapidly evolving we anticipate that content maintenance **modifications might be required approximately every 6 months** for global readiness depending on product updates, funding, and other factors.

Assumptions and Risks

This section lists assumptions and risks and their implications related to development of this product.

Assumption or Risk	Implication
The course assumes a “feature freeze” synchronized with Cisco UCS 2.0, NX-OS, VMware vSphere 5, and Microsoft Hyper-V R2 versions.	New features may appear during course development. Such features may be required to be included in this course, which would disrupt the course development schedule.
The BU (probably SAVTG, DCTG, SAVBU, or DCBU) SMEs and TMEs should be available to answer any questions related to the DCUCT v5.0 course content development for related products.	BU SMEs and TMEs not being available might influence the course development timelines.
L@C TECs and SMEs should be available for course design documents and content review.	L@C TECs and SMEs not being available might influence the course development timelines.
The equipment availability and any necessary additional software to be used in labs should be available to develop lab exercises within the scope of this course.	If equipment is not available the course development timelines may slip.
The course duration is limited to 3 days.	If there is too much content as determined by the alpha or beta class, some lower priority content may need to be removed.

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High-Level Course Design

Course Goal

The goal of the course is to prepare students to perform effective and efficient troubleshooting on the Cisco UCS products, based on the B-Series Servers and C-Series Servers.

Job Tasks and Domain and Skill Objectives

These are the job tasks (domains and skill objectives from the audience, as well as job definition and job task analyses that will be taught and practiced in the course).

1.00 Troubleshooting UCS Architecture and System Internals

1.01 Extract diagnostic data i.e., collecting dumps and core files

1.02 Identify issues using FSM

1.03 Troubleshoot boot issues (blades & OS)

1.04 Identify using CLI/GUI defective hardware

1.05 Troubleshoot management 0 KVM IP overlap issues

2.00 Troubleshooting UCS Installation, Configuration, and Startup

2.01 Configure and troubleshoot RBAC

2.02 Configure and troubleshoot modes and perform reboots

2.03 Configure and troubleshoot power consumption, power availability, and power policies

2.04 Manage service profiles

2.05 Understand and troubleshoot the UCSM upgrade process

2.06 Troubleshoot dynamic vnics on UCS

3.00 Troubleshooting UCS SAN/LAN/VLAN Connectivity

3.01 Configure & capture SPAN traces

3.02 Troubleshoot fiber channel services

3.03 Troubleshoot L2 issues

3.04 Troubleshoot link-level issues

3.05 Configure and troubleshoot jumbo frames

3.06 Troubleshoot dynamic vNIC

4.00 UCS Compute Troubleshooting

4.01 Troubleshoot CIMC GUI and CLI remote access methods

4.02 Using CLI/GUI Troubleshoot packet flow from server to the fabric

4.03 Identify the steps that need to be perform on a rack stand alone server prior to integration into the ucsm

4.04 Describe the various methods to update the server BIOS/CIMC/adapters/array controllers

4.05 Troubleshoot OS driver issues

4.06 Troubleshoot memory issues

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4.07 Troubleshoot boot issues

4.08 Troubleshoot redundant paths

4.09 Troubleshoot different adapters

4.10 Describe the process for password recovery

5.00 UCS C-Series Standalone Troubleshooting

5.01 Troubleshoot using CIMC GUI and CLI remote access methods

5.02 Use CIMC utilities for performance validation and data gathering activities

5.03 Update the server with the various methods (BIOS/CIMC/adapters/array controllers/LOM)

5.04 Troubleshoot OS driver issues

5.05 Troubleshoot memory issues

5.06 Troubleshoot boot issues

5.07 Troubleshoot Local Disk and RAID controller

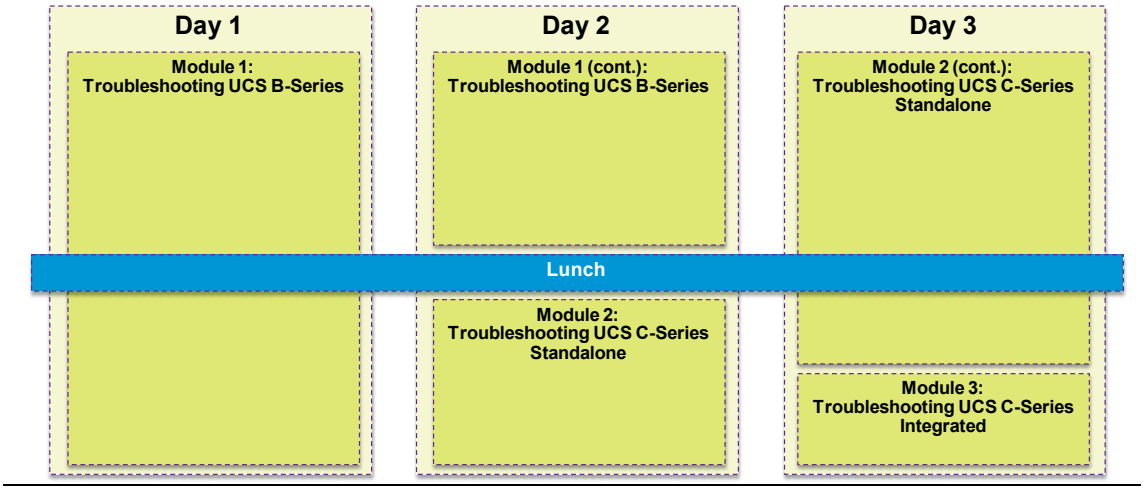
5.08 Troubleshoot FCoE Connectivity

5.09 Describe the process for password recovery

Course Flow Diagram

This section illustrates the flow of the course.

Depiction or Illustration of Flow and Structure of Learning



Day 1: Insert Lesson(s) or Topic(s) Here

8:30–9:20 (0830–0920)	Insert schedule item description here
9:30–10:20 (0930–1020)	Insert schedule item description here
10:30–12:00 (1030–1200)	Insert schedule item description here
12:00–1:00 (1200–1300)	**Lunch**

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1:00–1:50 (1300–1350)	Insert schedule item description here
2:00–2:50 (1400–1450)	Insert schedule item description here
3:00–3:50 (1500–1550)	Insert schedule item description here
4:00–5:00 (1600–1700)	Insert schedule item description here
5:00 (1700)	**Day ends**

Day 2: Insert Lesson(s) or Topic(s) Here

8:00–8:30 (0800–0830)	**Review of Day 1**
8:30–9:20 (0830–0920)	Insert schedule item description here
9:30–12:00 (0930–1200)	Insert schedule item description here
12:00–1:00 (1200–1300)	**Lunch**
1:00–1:50 (1300–1350)	Insert schedule item description here
2:00–2:50 (1400–1450)	Insert schedule item description here
3:00–5:00 (1500–1700)	Insert schedule item description here
5:00 (1700)	**Day ends**

Day 3: Insert Lesson(s) or Topic(s) Here

8:00–8:30 (0800–0830)	**Review of Day 2**
8:30–9:20 (0830–0920)	insert schedule item description here
9:30–12:00 (0930–1200)	insert schedule item description here
12:00–1:00 (1200–1300)	**Lunch**
1:00–1:50 (1300–1350)	Insert schedule item description here
2:00–2:50 (1400–1450)	Insert schedule item description here
3:00–5:00 (1500–1700)	Insert schedule item description here
5:00 (1700)	**Course Wrap-Up**

Course Structure and Objectives

This section describes the high-level, modular structure of the course and lists the module and lesson objectives. Describe the high-level structure of the course and any principles that apply to all modules.

Module 0: Course Introduction

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M0 Objective: Describe course positioning within the curricula and describe class logistics.

M0 Notes: Standard course introduction content

Module 1: Troubleshooting UCS B-Series

Module Objective: Upon completion of this module, the student should be able to recognize UCS B-series architecture, installation and configuration and the process and tools for determining problems related

Module 1 Lesson 1: Troubleshoot UCS B-Series Architecture and Initialization

Source: DCUCTS M1L2

M1L1 Objective: Describe UCS B-series architecture, initial setup, tools and service aids available for UCS troubleshooting and interpretation of the output.

M1L1 Job Tasks:

1.01 Extract diagnostic data i.e., collecting dumps and core files

1.02 Identify issues using FSM

1.05 Troubleshoot management 0 KVM IP overlap issues

1.04 Identify using CLI/GUI defective hardware

2.02 Configure and troubleshoot modes and perform reboots

M1L1 Notes

This lesson is intended to review UCS B-series architecture, components and their interaction, initial setup, tools and service aids available for UCS troubleshooting and to understand the output of the tools used

M1L1 Topic Titles

- Identify UCS System Architecture
- Troubleshoot UCS System Initialization
- Troubleshoot UCS with Embedded Tools
- Troubleshoot UCS Hardware Discovery

M1Lab1-1: UCS Support Tools

- Verify Server Port and Fabric Port operation
- Explore the command line interface (CLI)
- Review UCS system status using CLI and GUI
- Review system statistics and counters (for system, for components)
- Create and collect system core dump
- Review and interpret system logs
- Open remote KVM to assigned blade and perform rediscovery to observe FSM and Utility OS outputs

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Module 1 Lesson 2: Troubleshoot UCS B-Series Configuration

Source: DCUCTS M1L3-4

M1L2 Objective: Describe UCS B-series configuration and troubleshooting of issues related to system configuration

M1L2 Job Tasks:

2.01 Configure and troubleshoot RBAC

2.04 Manage service profiles

4.10 Describe the process for password recovery

M1L2 Notes

This Lesson is intended to provide the students with knowledge necessary to identify the source of, and resolution for UCS service profiles, RBAC and password recovery.

M1L2 Topic Titles

- Understand UCS System Configuration
- Understand UCS Server Deployment Configuration
- Troubleshoot UCS Server Deployment
- Troubleshoot UCS Management Configuration
- UCS System Password Recovery

Module 1 Lesson 3: Troubleshoot UCS B-Series Operation

Source: DCUCTS M1L3-4

M1L3 Objective: Describe UCS B-series operation and troubleshooting of issues related

M1L3 Job Tasks:

1.03 Troubleshoot boot issues (blades & OS)

2.03 Configure and troubleshoot power consumption, power availability, and power policies

4.01 Troubleshoot CIMC GUI and CLI remote access methods

4.05 Troubleshoot OS driver issues

4.07 Troubleshoot boot issues

M1L3 Notes

This Lesson is intended to provide the students with knowledge necessary to identify the source of, and resolution for power policies and related problems as well as boot and OS diver issues

M1L2 Topic Titles

- UCS System Power Management
- Troubleshoot UCS B-series Server Boot
- Troubleshoot OS Drivers
- Troubleshoot Remote Access

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Module 1 Lesson 4: Troubleshooting UCS B-Series LAN & SAN Connectivity

Source: DCUCTS M1L3-4

M1L4 Objective: Describe LAN, SAN and FC operations, including in depth troubleshooting procedures.

M1L4 Job Tasks:

2.02 Configure and troubleshoot modes and perform reboots

2.06 Troubleshoot dynamic vnics on UCS

3.01 Configure & capture SPAN traces

3.02 Troubleshoot fiber channel services

3.03 Troubleshoot L2 issues

3.04 Troubleshoot link-level issues

3.05 Configure and troubleshoot jumbo frames

3.06 Troubleshoot dynamic vNIC

4.02 Using CLI/GUI Troubleshoot packet flow from server to the fabric

4.08 Troubleshoot redundant paths

4.09 Troubleshoot different adapters

M1L4 Notes

This Lesson is intended to provide the students with knowledge necessary to identify the source of, and resolution for, complex LAN and SAN connectivity problems as well as SAN boot failures.

M1L4 Topic Titles

- Understand UCS B-series LAN Connectivity
- Troubleshoot UCS B-series LAN Connectivity
- Troubleshoot Redundant Connectivity
- Understand UCS B-series SAN Connectivity
- Troubleshoot UCS B-series SAN Connectivity
- Troubleshoot UCS B-series SAN Boot
- Use SPAN for Troubleshooting
- Verify packet flow
- Troubleshoot UCS Integration with Virtualization Platform

M1Lab 1-2: LAN and SAN Connectivity

- Review EHM using GUI and CLI
- Review Ethernet switching mode using GUI and CLI
- Review NPV using GUI and CLI
- Review FC switching mode using GUI and CLI

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- Review dynamic pinning and failover operation

Module 1 Lesson 5: Troubleshooting and Upgrading UCS Manager

Source: DCUCTS M1L5

M1L5 Objective: Identify best practices associated with upgrading UCS components and how to identify and resolve upgrade failures.

M1L5 Job Tasks:

2.05 Understand and troubleshoot the UCSM upgrade process

4.04 Describe the various methods to update the server BIOS/CIMC/adapters/array controllers

M1L5 Notes

This Lesson is intended to prepare the student to identify and, if possible, resolve problems associated with firmware changes.

M1L5 Topics:

- Identify Firmware Packaging
- Plan UCS Firmware Installation
- Determine Firmware Levels on UCS Components
- Perform the Firmware Upgrade Process

M1Lab 1-3: Troubleshooting and Upgrading UCS Manager

- Identify Currently Installed Firmware
- Create and Deploy a Maintenance Policy
- Create an IOM update procedure
- Create an NX-OS update procedure

Module 1 Lesson 6: Troubleshooting UCS B-Series Hardware

Source: DCUCTS M1L6

M1L6 Objectives: Identify best practices to troubleshooting UCS B-Series hardware.

M1L6 Job Tasks:

1.04 Identify using CLI/GUI defective hardware

4.06 Troubleshoot memory issues

M1L6 Notes

This Lesson is intended to prepare the student to identify and, if possible, resolve problems associated with memory problems, and to have the students demonstrate their ability to troubleshoot UCS problems.

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Describe standard memory terms and concepts. Utilize a variety of tools to troubleshoot DIMM failures. Analyze DIMM failures in the context of a blade's memory error reporting cycle.

M1L6 Topics:

- Identify Defective Hardware
- Troubleshoot Memory

M1Lab 1-4: Memory Data Collection and Memory Troubleshooting

- Observe memory status using BIOS
- Observe memory status using the UCS Manager GUI and CLI

Module 2: Troubleshooting UCS C-Series Standalone

M2 Objective: This module describes troubleshooting processes on the UCS C-Series Standalone.

Module 2 Lesson 1: UCS C-Series Troubleshooting Methodology

Source: DCUCSCTS M1L3-4, M7L1-4

M2L1 Objective: Upon completion the student will be able to describe CIMC utilities that enable performance validation and facilitate data gathering activities for UCS C-Series troubleshooting purposes.

M2L1 Job Tasks:

5.01 Troubleshoot using CIMC GUI and CLI remote access methods

5.02 Use CIMC utilities for performance validation and data gathering activities

5.09 Describe the process for password recovery

M2L1 Notes: The lesson will focus on presenting a list of common troubleshooting issues and recommended solutions, including performing proper configurations that can avoid many problems. The lesson will also focus on reviewing many resources that are included with the CIMC GUI that provide valuable real-time status, which facilitates swift trouble resolution. The lesson will present the two methods to perform local password recovery on the UCS C-Series servers. The lesson will present the management connectivity options for the UCS C-Series server models.

M2L1 Topics:

- Identify UCS C-series Architecture
- Understand UCS C-series Configuration
- Troubleshoot UCS C-series Initialization
- UCS C-series Password Recovery

M2Lab 2-1: Cisco Integrated Management Controller (CIMC) Discovery

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M2Lab 2-1 Objective: Upon completion, the student will be familiar with both the CIMC GUI and CLI and be able to navigate management utilities. The student will be able to review proper access configuration and troubleshooting.

M2Lab 2-1 Notes: In this activity, you will access both the CIMC GUI and CLI to become familiar with navigating these utilities and learning to interpret the various command outputs. This activity will focus on performing proper access configuration for the CIMC GUI and CLI.

Module 2 Lesson 2: Troubleshooting C-series Hardware and Firmware

Source: DCUCSCTS M2L1-4

M2L2 Objective: Upon completion the student will be able to describe firmware update.

M2L2 Job Tasks:

5.03 Update the server with the various methods (BIOS/CIMC/adapters/array controllers/LOM)

5.05 Troubleshoot memory issues

5.06 Troubleshoot boot issues

M2L2 Notes: The lesson will demonstrate the procedure to download the Host Upgrade Utility from www.cisco.com by using an active CCO account. The lesson will illustrate several different methods to perform a successful server firmware update.

M2L2 Topics:

- Identify C-series Firmware
- Host Upgrade Utility
- Perform the Firmware Upgrade Process
- Troubleshoot UCS C-series Boot
- Troubleshoot Memory

M2Lab 2-2: UCS C-Series Firmware Management

M2Lab 2-2 Objective: Upon completion, the student will download, install, and activate firmware upgrades by using the C-Series Host Upgrade Utility.

M2Lab 2-2 Notes: In this activity, you will log in to www.cisco.com with your CCO account and navigate to the Support option to download the HUU .iso. Your pod server will be booted by using the HUU, and the CIMC, BIOS, LOM, LSI controller, and P81E VIC adapter will be upgraded together.

Module 2 Lesson 3: Troubleshooting UCS C-Series LAN and SAN Connectivity

Source: DCUCSCTS M3L1-3, M4L1-3

M2L3 Objective: Define proper procedures to configure LAN connectivity and avoid issues with the P81E Virtual Interface Card (VIC). Define the proper procedures to configure SAN connectivity and avoid issues with the P81E Virtual Interface Card (VIC).

M2L3 Job Tasks:

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5.08 Troubleshoot FCoE Connectivity

M2L3 Notes: The lesson will present commonly encountered LAN connectivity issues and recommended solutions. The lesson illustrates the process for properly configuring SAN and vHBA properties in support of SAN boot operations. The lesson summarizes the Fibre Channel over Ethernet (FcoE) Initialization Protocol (FIP) and illustrates the steps to validate its proper operation. The lesson illustrates the process for determining P81E configuration-related problems.

M2L3 Topics:

- Troubleshoot UCS C-series LAN Connectivity
- Troubleshoot UCS C-series SAN Connectivity
- Troubleshoot UCS C-series SAN Boot

M2Lab 2-3: Troubleshooting LAN and SAN Connectivity

M2Lab 2-3 Objective: Upon completion, the student will review proper LAN connectivity of the P81E VIC and correctly configure and verify SAN connectivity by using the P81E Virtual Interface Card (VIC) interfaces.

M2Lab 2-3 Notes: This activity will focus on performing proper configuration for the P81E VIC. The CIMC GUI and CLI will be used to validate the configuration and properties of the default virtual network interface cards (vNICs). In addition, new vNICs will be created to describe the process of proper configuration. The student will connect to both Nexus 5548 switches and use various show commands to validate proper configuration on the FCoE multiprotocol access switch. This activity will focus on performing the proper configuration for the P81E VIC. The CIMC GUI and CLI will be used to validate the configuration and properties of the default virtual host bus adapter cards (vHBAs). The student will connect to Nexus 5548 switches and use various show commands to validate the proper configuration of FCoE and zoning.

Module 2 Lesson 4: Troubleshoot Locally Attached Storage

Source: DCUCSCTS M5L1-4

M2L4 Objective: Define RAID controller options and configuration utilities that facilitate the creation of virtual disks that may be used for booting various supported operating systems.

M2L4 Job Tasks:

5.07 Troubleshoot Local Disk and RAID controller

M2L4 Notes: The lesson presents and summarizes the UCS C-Series RAID controller support for the various server models. The lesson introduces the LSI SAS Extender and Expander, the RAID controllers they support, and the servers that may leverage their use. The lesson illustrates the process for utilizing various local storage configuration utilities to create virtual RAID disks. The lesson presents various common local disk and RAID troubleshooting scenarios and recommended solutions.

M2L4 Topics:

- Identify UCS C-series RAID Options

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- Troubleshoot UCS C-series Local Storage

M2Lab 2-4: Troubleshooting Local Disk Configuration

M2Lab 2-4 Objective: Upon completion, the student will become familiar with local disk RAID configuration procedures.

M2Lab 2-4 Notes: In this activity, you will access both the CIMC GUI and CLI to become familiar with navigating these utilities and learning to interpret the various command outputs. Log in to the CIMC GUI and review the Storage configuration. Log in to the CIMC Remote KVM and boot your pod server with a Windows operating system. Configure the LSI RAID controller by using the WebBIOS utility and creating a virtual disk. Validate the RAID storage configuration by booting your pod server with a Windows OS.

Module 2 Lesson 5: Troubleshoot Operating System Related Issues

Source: DCUCSCTS M6L1-4

M2L5 Objective: This lesson will present detailed steps for installing an operating system on both local disks and a remote Fibre Channel SAN LUN, as well as presenting several troubleshooting scenarios and proposed solutions.

M2L5 Job Tasks:

5.04 Troubleshoot OS driver issues

M2L5 Notes: The lesson describes the steps to perform proper installation of the Windows 2003 operating system onto a local virtual disk. The lesson describes the steps to perform proper installation of the Windows 2003 operating system onto a remote SAN LUN that is configured on a Fibre Channel storage array. The lesson illustrates the process to install additional device drivers after a Windows operating system installation. The lesson will present common local disk and SAN boot troubleshooting issues and their recommended solutions.

M2L5 Topics:

- Identify C-series OS Specifics
- Troubleshoot OS Deployment on C-series

Module 3: Troubleshooting UCS C-Series Integration

M3 Objective: This module describes the valid C-series integrated architecture and the process of determining problems related to integration of UCS C-series with UCS Manager

Module 3 Lesson 1: UCS C-Series and UCS Manager Integration Overview

Source: DCUCSCTS M8L1-3

M3L1 Objective: Recognize the architecture and components required for UCS C-series integration with UCS Manager

M3L1 Job Tasks:

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4.03 Identify the steps that need to be perform on a rack stand alone server prior to integration into the ucsm

M3L1 Notes: This lesson provides the students with the understanding of UCS C-series integration architecture and components required.

M3L1 Topics:

- UCS C-series Integration Architecture
- Identify C-series Integration Components

Module 3 Lesson 2: Implement UCS C-Series Integration

Source: DCUCSCTS M8L1-3

M3L2 Objective: Configure UCS Manager for C-series integration

M3L2 Job Tasks:

4.03 Identify the steps that need to be perform on a rack stand alone server prior to integration into the ucsm

M3L2 Notes: The lesson illustrates the process of properly connecting data and management paths for successful UCS C-Series server integration with UCS Manager.

M3L2 Topics:

- Add C-series to UCS Manager
- Verify C-series Integration

Module 3 Lesson 3: Troubleshoot UCS C-Series and UCS Manager Integration

Source: DCUCSCTS M8L1-3

M3L3 Objective: Troubleshoot the UCS C-Series server integration with UCS Manager

M3L3 Job Tasks:

4.01 Troubleshoot CIMC GUI and CLI remote access methods

4.04 Describe the various methods to update the server BIOS/CIMC/adapters/array controllers

M3L3 Notes: The lesson illustrates the process of properly connecting data and management paths for successful UCS C-Series server integration with UCS Manager and basic troubleshooting steps that are associated with UCS C-Series integration. The lesson also provides the students with the understanding of UCS C-series integration architecture and components required.

M3L3 Topics:

- Troubleshoot Connectivity Configuration
- Troubleshoot Software Compliance

Delivery Specifications

This section details the resources and requirements needed for delivery of the learning product.

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Required Tools and Resources

Required Item	Explanation and Notes

Supporting Personnel

Name	Function

Required Classroom Reference Materials

Required Item	Explanation and Notes
Student Guide	Yes
Lab Guide	Yes
Course Evaluation Form	Yes
Course Administration Guide	Yes
Instructor Slide Package	Yes
Other	

Required Classroom Environment

Room setup, layout, logistics, and equipment:

- The course requires a typical classroom for instructor-led training delivery of Cisco training:
  - Whiteboard
  - Projector
  - Internet access
  - Sufficient seating with tables
  - One PC per student

Instructor Certification Requirements

Credentials to teach this version of the course are:

- Be a Certified Cisco Systems Instructor (CCSI) in good standing.
- Attend the DCUCT 5.0 train-the-trainer (TTT) session or a regular DCUCT 5.0 course delivery as a learner
- Pass the respective DCUCT 5.0 exam at the instructor passing score

Laboratory Topology (Delivery)

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General Information

This lab is an upgraded subset of the common topology used in data center unified computing (DCUCI v4.0 and DCUCD v4.0) courses. The lab uses a topology that resembles that of an enterprise data center environment: compute infrastructure, storage infrastructure, LAN, and SAN.

Overall Lab Description

The lab topology consists of the following lab devices:

- Two Cisco Nexus 5548UP switches with the following modules:
  - Layer 3 daughter card
  - 32 fixed 10GE ports
  - Layer 3 license
  - Two power supplies
- Two Cisco Nexus 5548UP switches with the following modules:
  - 32 fixed 10GE ports
  - Two power supplies
  - Eight 10GE SFP+
  - Eight 4Gb/s Fibre Channel SW SFPs
- Two Cisco MDS 9124 switches
- Fiber Channel Storage array with two fiber channel interfaces
- Two Cisco UCS 6120 Fabric Interconnect switches with the following modules:
  - Eight 4Gb/s Fibre Channel SW SFPs
  - Two power supplies
- One Cisco UCS 5108 chassis
- Two Cisco UCS 2104XP IO modules
- Eight Cisco UCS B200-M2 Server Blades with the following modules:
  - M81KR VIC
  - 16GB RAM
  - Two Intel Xeon 55x0 processors
- Eight Cisco UCS C200-M2 Rack Servers with the following modules:
  - Two Intel Xeon 55x0 processors
  - 16GB RAM
  - LSI 6G MegaRAID 9260-4i card with RAID 0,1,5,6,10 support
  - Four SAS or SATA hard drives
  - TPM module for Cisco UCS C200 M1 Rack Server
  - Cisco UCS P81E VIC
- Four rack-mount servers with VMware vSphere 5.0 hosting student and instructor desktop VMs and VMware vCenter

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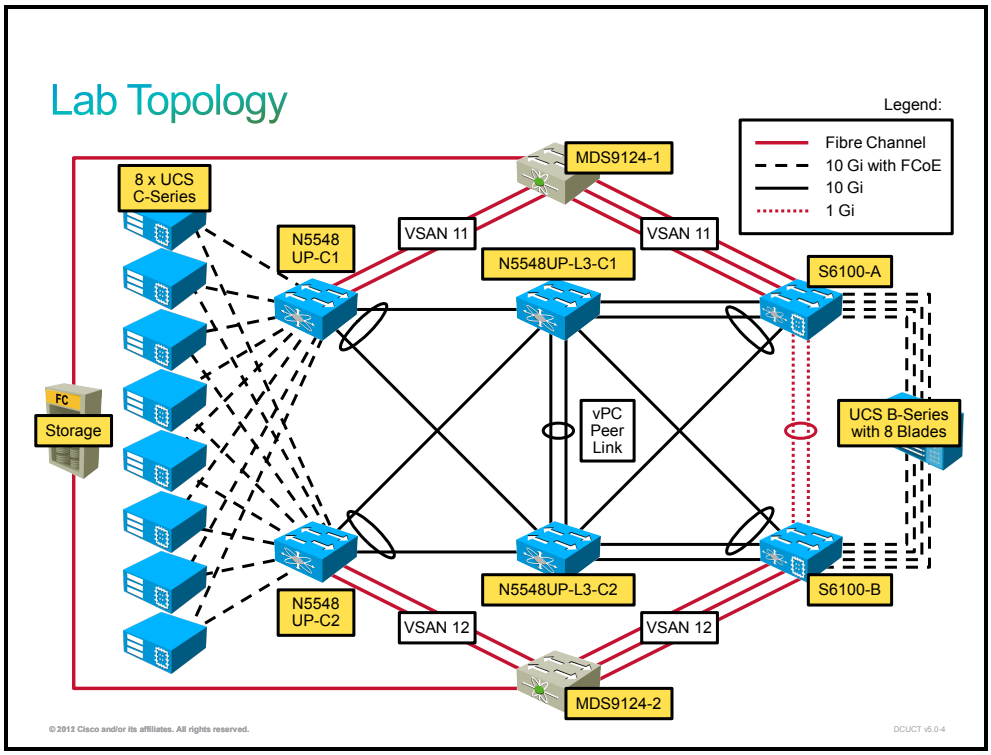
The lab physical topology is depicted in the following figure.

Lab Topology Diagram (Backbone Pod View)

The backbone pod interconnects all individual student pods and simulates data center LAN, SAN, and storage infrastructure.



Lab Topology Diagram (Learner Pod View)

Each student pod consists of:

- One Cisco UCS B200 M2 server blade
- One Cisco UCS C200 M2 rack server
- Assigned LUNs on storage drive array

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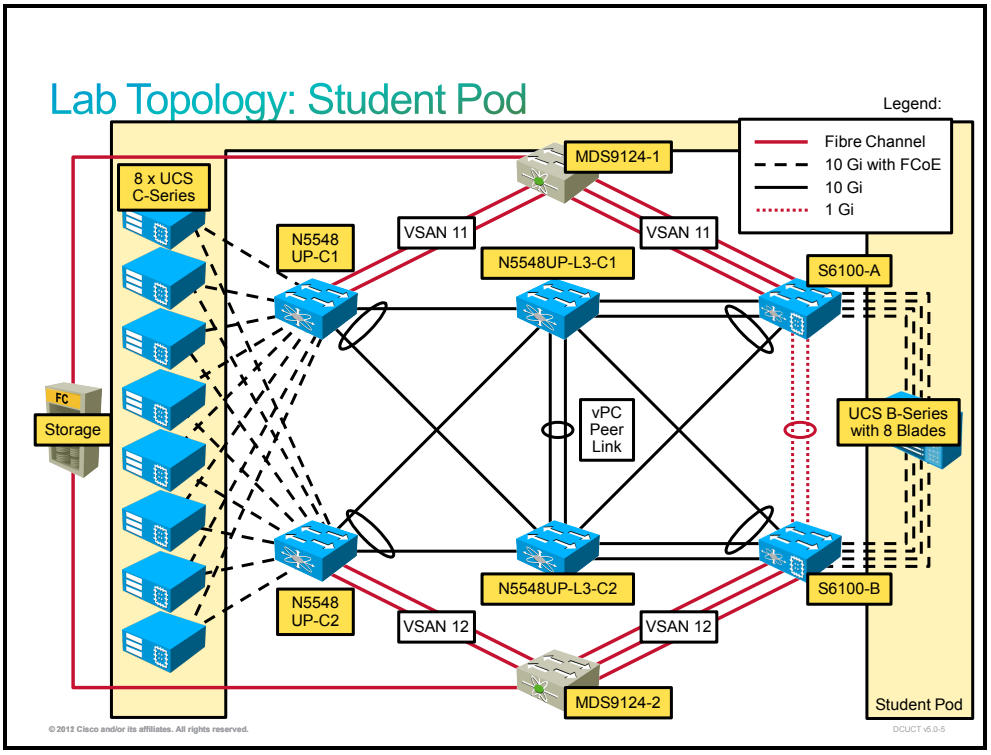

Laboratory Equipment

These tables list the recommended equipment to support the lab activities. These tables assume a class size of 16 learners—two per pod.

Hardware List

Description	Mfr.	Part Number	Qty.	Notes
Nexus 5548UP	Cisco	N5K-C5548UP-FA	2	
Cisco Nexus 5000 Base OS Software Release 5.0(3)N1(1)	Cisco	N5KUK9-503N1.1	2	
10GBASE-CU SFP+ Cable 5 Meter	Cisco	SFP-H10GB-CU5M	8	
Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	Cisco	CAB-9K12A-NA	4	
4 Gbps Fibre Channel-SW SFP, LC	Cisco	DS-SFP-FC4G-SW	4	
Accessory Kit for Nexus 5548 Chassis	Cisco	N5548-ACC-KIT	2	
Cisco Nexus 5500 Layer 3 Base software license	Cisco	N55-BAS1K9	2	
Nexus 5548 Layer 3 Daughter Card, version 2	Cisco	N55-D160L3-V2	2	
Nexus 5010 Storage Protocols Services License	Cisco	N5010-SSK9	2	
Storage Protocols Services Package	Cisco	N55-8P-SSK9	2	
FCoE NPV Package	Cisco	N5548-FNPV-SSK9	2	
4Gbps Fibre Channel-SW SFP, LC	Cisco	DS-SFP-FC4G-SW=	4	
10GBASE-CU SFP+ Cable 5 Meter		SFP-H10GB-CU5M	4	

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Description	Mfr.	Part Number	Qty.	Notes
MDS 9124 Fabric Switch		DS-C9124AP-K9	2	
Optional redundant AC power supply (uninstalled), (CTO)		DS-C24-300AC	2	
Power Cord, 125VAC 13A NEMA 5-15 Plug, North America		CAB-9K12A-NA	4	
4Gbps Fibre Channel-SW SFP, LC		DS-SFP-FC4G-SW=	4	
Cisco UCS 6120XP Fabric Interconnect	Cisco	N10-S6100	2	
Cisco UCS 5108 Chassis	Cisco	N20-C6508	1	
Cisco UCS B-Series Server Blade	Cisco	N20-B6620-1	8	
Cisco UCS 2104XP I/O Module	Cisco	N20-I6584	2	
Cisco UCS M81KR VIC for B-Series Server Blade	Cisco	N20-AC0002	8	
4Gbps Fibre Channel-SW SFP, LC	Cisco	DS-SFP-FC4G-SW=	8	
10GBASE-CU SFP+ Cable 5 Meter	Cisco	SFP-H10GB-CU5M	12	
Cisco UCS C-Series rack server with P81 NIC	Cisco	R200-1120402W	10	
2.13GHz Xeon E5605 80W CPU/4MB cache/DDR3 800MHz	Cisco	A01-X0113	10	
4GB DDR3-1333MHz RDIMM/PC3-10600/dual rank 1Gb DRAMs	Cisco	N01-M304GB1	30	
Rail Kit - UCS C200, C210 and 250 M1 Rack Servers	Cisco	R250-SLDRAIL	10	
Power Cord, 200/240V 6A North America	Cisco	CAB-N5K6A-NA	10	
10GBASE-CU SFP+ Cable 5 Meter	Cisco	SFP-H10GB-CU5M	20	
FC attached storage			1	
Internal SAS 300GB Hard Drive			6	
Power Cord, 110V 30A North America			2	
Fibre Optic patch cords for Fibre Channel SFP			8	

Software List

Description	Mfr.	Part Number	Qty.	Notes
Windows 2008 R2	Microsoft		16	
Windows 7 Enterprise	Microsoft		8	
VMware ESXi 5.0 Enterprise plus	VMware		16	
vCenter Server	VMware		8	
IPMITool	Open Source		16	
Cygwin	Open Source		16	
3CDaemon Freeware	3Com		16	

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Description	Mfr.	Part Number	Qty.	Notes
puTTY SSH	Simon Tatham		16	

Notes on Delivery Lab Equipment

No special notes have been identified.

Development Lab Equipment Requirements

This section details the resources and requirements needed to develop and test the course labs.

Required Resources

Required Item	Explanation and Notes

Supporting Personnel

Required Item	Explanation and Notes
Lab support team	Implement changes if necessary

Required Materials

- No special material has been identified

Laboratory Topology (Development)

Lab development requires two developer pods. The pods can be remotely available to the developers. For the purpose of reviewing the developed content the pods must be remotely available for TEC reviewers to review the labs in a live environment.

The software and hardware list is the same as for production pods.

Hardware List

Description	Mfr.	Part Number	Qty.	Notes
Nexus 5548UP	Cisco	N5K-C5548UP-FA	2	
Cisco Nexus 5000 Base OS Software Release 5.0(3)N1(1)	Cisco	N5KUK9-503N1.1	2	
10GBASE-CU SFP+ Cable 5 Meter	Cisco	SFP-H10GB-CU5M	8	
Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	Cisco	CAB-9K12A-NA	4	
4 Gbps Fibre Channel-SW SFP, LC	Cisco	DS-SFP-FC4G-SW	4	
Accessory Kit for Nexus 5548 Chassis	Cisco	N5548-ACC-KIT	2	
Cisco Nexus 5500 Layer 3 Base software license	Cisco	N55-BAS1K9	2	
Nexus 5548 Layer 3 Daughter Card, version 2	Cisco	N55-D160L3-V2	2	

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Description	Mfr.	Part Number	Qty.	Notes
Nexus 5010 Storage Protocols Services License	Cisco	N5010-SSK9	2	
Storage Protocols Services Package	Cisco	N55-8P-SSK9	2	
FCoE NPV Package	Cisco	N5548-FNPV-SSK9	2	
4Gbps Fibre Channel-SW SFP, LC	Cisco	DS-SFP-FC4G-SW=	4	
10GBASE-CU SFP+ Cable 5 Meter		SFP-H10GB-CU5M	4	
MDS 9124 Fabric Switch		DS-C9124AP-K9	2	
Optional redundant AC power supply (uninstalled), (CTO)		DS-C24-300AC	2	
Power Cord, 125VAC 13A NEMA 5-15 Plug, North America		CAB-9K12A-NA	4	
4Gbps Fibre Channel-SW SFP, LC		DS-SFP-FC4G-SW=	4	
Cisco UCS 6120XP Fabric Interconnect	Cisco	N10-S6100	2	
Cisco UCS 5108 Chassis	Cisco	N20-C6508	1	
Cisco UCS B-Series Server Blade	Cisco	N20-B6620-1	8	
Cisco UCS 2104XP I/O Module	Cisco	N20-I6584	2	
Cisco UCS M81KR VIC for B-Series Server Blade	Cisco	N20-AC0002	8	
4Gbps Fibre Channel-SW SFP, LC	Cisco	DS-SFP-FC4G-SW=	8	
10GBASE-CU SFP+ Cable 5 Meter	Cisco	SFP-H10GB-CU5M	12	
Cisco UCS C-Series rack server with P81 NIC	Cisco	R200-1120402W	10	
2.13GHz Xeon E5605 80W CPU/4MB cache/DDR3 800MHz	Cisco	A01-X0113	10	
4GB DDR3-1333MHz RDIMM/PC3-10600/dual rank 1Gb DRAMs	Cisco	N01-M304GB1	30	
Rail Kit - UCS C200, C210 and 250 M1 Rack Servers	Cisco	R250-SLDRAIL	10	
Power Cord, 200/240V 6A North America	Cisco	CAB-N5K6A-NA	10	
10GBASE-CU SFP+ Cable 5 Meter	Cisco	SFP-H10GB-CU5M	20	
FC attached storage			1	
Internal SAS 300GB Hard Drive			6	
Power Cord, 110V 30A North America			2	
Fibre Optic patch cords for Fibre Channel SFP			8	

Software List

Description	Mfr.	Part Number	Qty.	Notes
Windows 2008 R2	Microsoft		16	
Windows 7 Enterprise	Microsoft		8	

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Description	Mfr.	Part Number	Qty.	Notes
VMware ESXi 5.0 Enterprise plus	VMware		16	
vCenter Server	VMware		8	
IPMITool	Open Source		16	
Cygwin	Open Source		16	
3CDaemon Freeware	3Com		16	
puTTY SSH	Simon Tatham		16	

Notes on Development Lab Equipment

No special notes have been identified.

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Detailed Course Design

This section details Lesson, Topic, Activity, and Lab content within the Module and Lesson structure of the course. This Detailed Course Design section is updated while the course contents are developed. At the end of development, the Design Document will be an accurate blueprint of the final course content.

Module 0 of 3: Course Introduction

Module Objective: Describe course positioning within the curricula and describe class logistics.

Module 0 Lesson 1 of 1: Course Overview

Lesson Objective: Module 0 sets the context of the course and introduces it to the learners.

- Course goal
- Course positioning in certifications and curricula
- Target audiences
- Course overview
- Summary of prerequisites
- Course agenda and schedule
- Introductions, facilities, and logistics

Module 0 Lesson 1 Topic 1 of 5	Course Overview
Topic Objectives	Describe course goal and objective
Media Treatment (Visuals)	Lecture using static slides
Content Types or Media Objects	Identify course goal Identify course benefits Identify prerequisite learner skills and knowledge
Sources	DCUCTS with updates

Module 0 Lesson 1 Topic 2 of 5	DCUCT Curriculum
Topic Objectives	Recognize DCUCT curriculum
Media Treatment (Visuals)	Lecture using static slides
Content Types or Media Objects	Position DCUCT course Present course flow and structure with explanation (graphic) Present graphical symbols and icons used in the course (graphic)
Sources	DCUCTS with updates

Module 0 Lesson 1 Topic 3 of 5	Certification
Topic Objectives	Recognize certification requirements for DCUCT

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Module 0 Lesson 1 Topic 3 of 5	Certification
Media Treatment (Visuals)	Lecture using static slides
Content Types or Media Objects	Cisco Data Center Unified Computing Troubleshooting
Sources	DCUCTS with updates NOTE – this should be updated per final requirements/certifications/…

Module 0 Lesson 1 Topic 4 of 5	Resources
Topic Objectives	Identify other related resources
Media Treatment (Visuals)	Lecture using static slides
Content Types or Media Objects	PEC Cisco Partner Resource Central Web pages screenshots and graphics add others from public cisco website if applicable
Sources	DCUCTS with updates www.cisco.com/go/pec www.ciscoprc.com

Module 0 Lesson 1 Topic 5 of 5	Student Introduction
Topic Objectives	Understand student motivation for course attendance
Media Treatment (Visuals)	Interactive discussion
Content Types or Media Objects	General slide with personal info i.e. bullets for name, company, certification level, …
Sources	DCUCTS with updates

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Module 1 of 3: Troubleshooting UCS B-Series

Module Objective: Describe the UCS B-series architecture, installation and configuration and the process and tools for determining problems related

Module 1 Lesson 1 of 6: Troubleshoot UCS B-Series Architecture and Initialization

Lesson Objective: Describe UCS B-series architecture, initial setup, tools and service aids available for UCS troubleshooting and interpretation of the output.

Module 1 Lesson 1 Topic 1 of 4	Identify UCS System Architecture
Topic Objectives	Identify UCS B-series system architecture
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review overall UCS B-series system architecture ▪ how UCS B-series components fit together ▪ connectivity requirements of UCS FI cluster ▪ what is the purpose of each component ▪ what kind of “logic” component has ▪ fabric interconnects relevant details (gen1, gen2 – 6200) – UP ports ▪ chassis ▪ servers M1/M2/M3 ▪ adapters – VIC (M81KR, VIC1240 & LOM VIC1240, VIC1280), CNAs, Ethernet-only ▪ IOMs – gen1 – 2104XP, gen2 – 2204/2208 ▪ cabling options ▪ recognize valid vs. invalid UCS topologies ▪ UCS Manager and management requirements (i.e. IP addresses) and functions/features that can be implemented by its means ▪ management IP addressing and remote KVM IP address requirements (IPs from same subnet or secondary IPs
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC124, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 1 Topic 2 of 4	Troubleshoot UCS System Initialization
Topic Objectives	Troubleshoot UCS B-series system initialization
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Describe the UCS system initialization processes ▪ standalone vs. clustered FI mode ▪ identify potential failures and errors that can occur upon system initialization ▪ use GUI/CLI to detect faulty interfaces and initialization failures ▪ perform reboots ▪ identify issues with overlapping IP addresses on mgmt 0 and/or KVM
Sources	DCUCTS with updates + SMEs and TAC personnel input

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Module 1 Lesson 1 Topic 3 of 4	Troubleshoot UCS with Embedded Tools
Topic Objectives	Troubleshoot UCS B-series system with embedded tools
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize the UCS embedded troubleshooting, pre-troubleshooting and diagnostic tools and how/where to use them ▪ FSM – its function and operation ▪ Collecting dumps and core files ▪ Call-home ▪ Logs and event history (for the whole system, per component, …) ▪ GUI/CLI based 'show' commands, tools and service aids
Sources	DCUCTS with updates (M1L2) + SMEs and TAC personnel input

Module 1 Lesson 1 Topic 4 of 4	Troubleshoot UCS Hardware Discovery
Topic Objectives	Troubleshoot UCS B-series hardware discovery
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Describe the UCS system hardware discovery process ▪ discovery of UCS chassis and blades with emphasis on relevant policies that take effect upon the process (i.e. server qualification and automatic pool assignment, IOM-to-FI link connectivity, …) ▪ identify potential failures and errors that can occur upon discovery ▪ use GUI/CLI to detect discovery failures ▪ extract diagnostic data to identify discovery issues ▪ review FSM output to identify discovery issues ▪ review Utility OS output and understand its function
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 1 Activity or Lab 1-1: UCS Support Tools

Item	Description
Activity Objectives	Use UCSM embedded tools to collect relevant UCS system information
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**

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Item	Description
Task 1	Verify Server Port and Fabric Port operation
Task 2	Explore the command line interface (CLI)
Task 3	Review UCS system status using CLI and GUI
Task 4	Review system statistics and counters (for system, for components)
Task 5	Create and collect system core dump
Task 6	Review and interpret system logs
Task 7	Open remote KVM to assigned blade and perform rediscovery to observe FSM and Utility OS outputs
Activity Verification	Learners have completed the activity when they have attained these results: • Connect to UCSM via GUI and CLI • Make familiar with CLI (connect, scope, …) • Review existing environment setup • Review system statistics and counters • Review relevant environmental parameters • Collect system core dump • Review system logs • Review FSM and Utility OS output upon blade discovery

Module 1 Lesson 2 of 6: Troubleshoot UCS B-Series Configuration

Lesson Objective: Describe UCS B-series configuration and troubleshooting of issues related

Module 1 Lesson 2 Topic 1 of 5	Understand UCS System Configuration
Topic Objectives	Recognize UCS B-series system configuration and normal operation
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review of overall UCS B-series system configuration ▪ physical equipment configuration i.e. uplinks, downlinks, FC links, …) ▪ global management and operational policies ▪ disrupting vs. non-disrupting configuration changes
Sources	DCUCTS with updates (i.e. UCSM 2.0 and new functions available in new software)

Module 1 Lesson 2 Topic 2 of 5	Understand UCS Server Deployment Configuration
Topic Objectives	Recognize UCS B-series server deployment configuration
Media Treatment (Visuals)	Lecture with static slides

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Module 1 Lesson 2 Topic 2 of 5	Understand UCS Server Deployment Configuration
Content Types or Media Objects	Based on previous knowledge review of UCS B-series server deployment configuration ▪ service profiles and templates ▪ vNIC, vHBA and templates ▪ pools & policies ▪ management IP addressing and remote KVM IP address requirements (IPs from same subnet or secondary IPs) ▪ management policies ▪ disrupting vs. non-disrupting configuration changes ▪ identify most common errors when applying service profiles(e.g. applying SP with 6 vNICs, 2 vHBAs to a blade with CNA, …)
Sources	DCUCTS with updates (i.e. UCSM 2.0 and new functions available in new software)

Module 1 Lesson 2 Topic 3 of 5	Troubleshoot UCS Server Deployment
Topic Objectives	Troubleshoot UCS B-series service profile configuration
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify and troubleshoot service profile related problems ▪ most common errors when applying service profiles(e.g. applying SP with 6 vNICs, 2 vHBAs to a blade with CNA, …) using diagnostic data and FSM ▪ errors related to insufficient configuration of pools (i.e. not enough MAC, WWN, UUID addresses) ▪ errors related to using default identifiers (i.e. MAC, WWN,…) – VIC not having burned-in address, using burned in address prevents SP migration ▪ association ▪ de-association ▪ how to verify UCS blade is configured properly per service profile
Sources	DCUCTS with updates (i.e. UCSM 2.0 and new functions available in new software)

Module 1 Lesson 2 Topic 4 of 5	Troubleshoot UCS Management Configuration
Topic Objectives	Recognize UCS B-series management configuration
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review of UCS B-series configuration ▪ RBAC ▪ locales ▪ organizations ▪ management/configuration hierarchy Troubleshoot common RBAC related issues ▪ local-database related issues ▪ integration with RADIUS/TACACS+ and related issues integration with AD/LDAP and related issues

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Module 1 Lesson 2 Topic 4 of 5	Troubleshoot UCS Management Configuration
Sources	DCUCTS with updates

Module 1 Lesson 2 Topic 5 of 5	UCS System Password Recovery
Topic Objectives	Recognize the steps necessary to perform UCS B-series password recovery
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	List the steps and describe the process of password recovery on UCS B-series system. Identify requirements for admin account password recovery (i.e. physical presence, downtime due to reboot). Identify requirements for other accounts password recovery (i.e. UCS Manager access, account with admin or aaa privileges, …)
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 1 Lesson 3 of 6: Troubleshoot UCS B-Series Operation

Lesson Objective: Describe UCS B-series operation and troubleshooting of issues related

Module 1 Lesson 3 Topic 1 of 4	UCS System Power Management
Topic Objectives	Recognize UCS power consumption, availability and power policies
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize the power requirements and consumption of UCS Understand the operation and modes of power supplies Understand and configure power capping and policies Verify/troubleshoot UCS power related issues ▪ power consumption and counters (by components and per system) ▪ available system power ▪ power policies and capping operation ▪ power redundancy schemes for 5108 and available power
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 1 Lesson 3 Topic 2 of 4	Troubleshoot UCS B-series Server Boot
Topic Objectives	Troubleshoot UCS B-series server boot
Media Treatment (Visuals)	Lecture with static slides

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Module 1 Lesson 3 Topic 2 of 4	Troubleshoot UCS B-series Server Boot
Content Types or Media Objects	Recognize the UCS B-series boot process ▪ understand server blade boot process (quiet boot, Function keys,…) ▪ how to “break-into” server BIOS, ▪ how to “break-into” adapter BIOS ▪ breaking into RAID controller BIOS ▪ OS specific boot aspects ▪ server re-boot/reset/re-acknowledge ▪ RAID specific configuration, troubleshooting and specifics ▪ Boot policy specifics (protected RAID config) ▪ boot issues when replacing failed server and using existing disks
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 1 Lesson 3 Topic 3 of 4	Troubleshoot OS Drivers
Topic Objectives	Identify and troubleshoot OS driver related issues
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize where OS drivers can be obtained Match OS driver type and version with hardware used Install/re-install proper drivers to resolve OS issues (i.e. non-recognized hardware)
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 1 Lesson 3 Topic 4 of 4	Troubleshoot Remote Access
Topic Objectives	Identify and troubleshoot blade remote access
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize remote KVM operation Identify common issues related to CIMC remote access methods
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 1 Lesson 4 of 6: Troubleshooting UCS B-Series LAN & SAN Connectivity

Lesson Objective: Describe LAN, SAN and FC operations, including in depth troubleshooting procedures.

Module 1 Lesson 4 Topic 1 of 9	Understand UCS B-series LAN Connectivity
Topic Objectives	Troubleshoot UCS B-series system LAN connectivity
Media Treatment (Visuals)	Lecture with static slides

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Module 1 Lesson 4 Topic 1 of 9	Understand UCS B-series LAN Connectivity
Content Types or Media Objects	Based on previous knowledge review overall UCS B-series system LAN connectivity ▪ port roles – uplinks, downlinks, IOM-to-FI, … ▪ Uplink port-channels, operation ▪ Ethernet interfaces – optical vs. copper ▪ EHM vs. switching mode + requirements, operation specifics and reboot requirement ▪ dynamic vs. admin pinninig ▪ discrete vs. port-channel operation (IOM 2208 specifics) ▪ adapter based port-channels (i.e. VIC 1280) ▪ VIC 1240 specifics (i.e. combination of LOM and mezzanine) ▪ disjoint Layer-2 domains and operational specifics ▪ UP ports ▪ fabric failover operation and specifics ▪ jumbo frames
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 4 Topic 2 of 9	Troubleshoot UCS B-series LAN Connectivity
Topic Objectives	Troubleshoot UCS B-series system LAN connectivity
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Troubleshoot UCS LAN aspects ▪ Ethernet interfaces common errors/issues and link-level issues ▪ disjoint Layer-2 domains and configuration errors (i.e. overlapping VLANs, …) ▪ common errors/issues related to UP ports ▪ jumbo frames relate issues ▪ layer 2 issues
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 4 Topic 3 of 9	Troubleshoot Redundant Connectivity
Topic Objectives	Troubleshoot UCS B-series server redundant connectivity
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Troubleshoot UCS LAN aspects ▪ Port-channel common errors (mismatch, uplink, IOM, adapter based) ▪ fabric failover and pinning (dynamic vs. admin pininig) relation and common errors ▪ layer 2 issues ▪ adapter related issues

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Module 1 Lesson 4 Topic 3 of 9	Troubleshoot Redundant Connectivity
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 4 Topic 3 of 9	Understand UCS B-series SAN Connectivity
Topic Objectives	Recognize UCS B-series system SAN connectivity
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review overall UCS B-series system SAN connectivity ▪ port roles – uplinks ▪ FCoE specifics ▪ FC Uplink port-channels, operation ▪ NPV mode (i.e. core switch NPIV requirement, VSAN requirements, …) ▪ FC switching mode ▪ FC trunks ▪ dynamic vs. admin pininig ▪ FC UP ports
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 4 Topic 4 of 9	Troubleshoot UCS B-series SAN Connectivity
Topic Objectives	Troubleshoot UCS B-series system SAN connectivity
Media Treatment (Visuals)	Lecture with static slides

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Module 1 Lesson 4 Topic 4 of 9	Troubleshoot UCS B-series SAN Connectivity
Content Types or Media Objects	Based on previous knowledge review overall UCS B-series system SAN connectivity ▪ FCoE VLAN ID and overlap issues ▪ FC Uplink port-channels common errors (mismatch) ▪ NPV mode common errors (i.e. core switch NPIV requirement, VSAN requirements, …) ▪ FC switching mode common issues (i.e. zoning, default zone, …) ▪ Interface related issues like isolated interfaces ▪ FC trunk common issues i.e. VSAN mis-match ▪ pinnig relate issues ▪ HBA related specifics and common issues (i.e. WWNN/WWPN assignment and empty pools leads to zoning/LUN masking issues, …) ▪ HA related issues ▪ FC UP ports errors/issues Identify and troubleshoot available storage attachment options ▪ FC attached storage via core FC switch ▪ FC storage attached directly to UCS FIs ▪ NAS (i.e. NFS, iSCSI) via core LAN ▪ NAS (i.e. NFS, iSCSI) directly via UCS FI (i.e. direct attached storage)
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 2 Topic 6 of 9	Troubleshoot UCS B-series SAN Boot
Topic Objectives	Troubleshoot UCS B-series SAN Boot
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify and troubleshoot SAN Boot issues ▪ recognize valid operation and configuration ▪ LUN ID mismatch ▪ Boot policy issues ▪ zoning related issues ▪ HBA specific issues (i.e. WWPN, VSAN mismatch, …)
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Lesson 4 Topic 7 of 9	Use SPAN for Troubleshooting
Topic Objectives	Troubleshoot UCS B-series traffic using SPAN
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Use SPAN to capture traffic traces (Ethernet as well as FC) Understand SPAN configuration i.e. sources destination Configure SPAN to capture traffic
Sources	DCUCTS with updates

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Module 1 Lesson 4 Topic 8 of 9	Verify packet flow
Topic Objectives	Troubleshoot UCS server to fabric packet flow using GUI/CLI
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize packet flow from server to the fabric (i.e. path selection in regards to pinning or port load sharing with port-channels) Use CLI “show” commands to trace the path from server to the fabric
Sources	DCUCTS with updates

Module 1 Lesson 4 Topic 9 of 9	Troubleshoot UCS Integration with Virtualization Platform
Topic Objectives	Troubleshoot UCS B-series integration with server virtualization platform
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify and troubleshoot UCS integration with sever virtualization platform (i.e. VMware vSphere) ▪ Review vCenter and UCSM part of requirements and configuration ▪ Issues related to vCenter and UCSM communication ▪ Port-profiles common issues ▪ Deleting UCSM based vDS from vCenter ▪ Re-setting UCSM based vDS ▪ Recognize and troubleshoot dynamic vNICs (maximums, IOM uplink relation, traffic forwarding, pinning to uplinks, failover & MAC synchronization)
Sources	DCUCTS with updates (i.e. new gen2/gen3 hardware – 6200, 2204/2208IOM, VIC1240, VIC1280, M3 gen servers, UCSM 2.0)

Module 1 Activity or Lab 1-2: LAN and SAN Connectivity

Item	Description
Activity Objectives	Review UCS EHM, NPV operational modes and UF connectivity
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Review EHM using GUI and CLI
Task 2	Review Ethernet swithcing mode using GUI and CLI

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Item	Description
Task 3	Review NPV using GUI and CLI
Task 4	Review FC swithcing mode using GUI and CLI
Task 5	Review dynamic pinning and failover operation
Activity Verification	Learners have completed the activity when they have attained these results: • Connect to UCSM via GUI and CLI • Review EHM • Review NPV • Review Ethernet switching mode • Review FC switching mode • Use CLI to explore dnyamic vNICs – pinning • Initiate fabric failover and review static & dynamic vNIC operation/convergence

Module 1 Lesson 5 of 6: Troubleshooting and Upgrading UCS Manager

Lesson Objective: Identify best practices associated with upgrading UCS components and how to identify and resolve upgrade failures.

Module 1 Lesson 6 Topic 1 of 4	Identify Firmware Packaging
Topic Objectives	Distinguish between individual component firmware and firmware bundles
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	UCS firmware download and installation
Sources	DCUCTS with updates

Module 1 Lesson 6 Topic 2 of 4	Plan UCS Firmware Installation
Topic Objectives	Install catalogs and management extensions to add support for new hardware
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identifying and resolving firmware failures
Sources	DCUCTS with updates

Module 1 Lesson 6 Topic 3 of 4	Determine Firmware Levels on UCS Components
Topic Objectives	Identify running and startup firmware on all UCS components
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identifying and resolving firmware failures
Sources	DCUCTS with updates

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Module 1 Lesson 6 Topic 4 of 4	Perform the Firmware Upgrade Process
Topic Objectives	Define the general upgrade process for all UCS components
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identifying and resolving firmware failures
Sources	DCUCTS with updates

Module 1 Activity or Lab 1-3: Troubleshooting and Upgrading UCS Manager

Item	Description
Activity Objectives	Download, install and activate UCS component firmware
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Identify currently installed firmware
Task 2	Create and deploy a maintenance policy
Task 3	Create an IOM update procedure
Task 4	Create an NX-OS update procedure
Activity Verification	Learners will have successfully completed this lab when they have installed UCS component firmware and verified proper operation

Module 1 Lesson 6 of 6: Troubleshooting UCS B-Series Hardware

Lesson Objective: Identify best practices to troubleshooting UCS B-Series hardware.

Module 1 Lesson 6 Topic 1 of 2	Identify Defective Hardware
Topic Objectives	Use UCS CLI/GUI to detect failed hardware
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify hardware failures using CLI/GUI tools (i.e.event history, alarms, …)
Sources	DCUCTS with updates

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Module 1 Lesson 6 Topic 2 of 2	Troubleshoot Memory
Topic Objectives	List tools and techniques used to identify memory configuration errors and memory failures (lecture, paper exercise only), including identification of common failures as identified by TAC
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Memory configuration and failure recognition
Sources	DCUCTS with updates

Module 1 Activity or Lab 1-4: Memory Data Collection and Memory Troubleshooting

Item	Description
Activity Objectives	Given a failed UCS system, using tools, service aids and techniques learned in this course, identify the cause of the failure(s) and resolve the problems where possible
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Observe memory status using BIOS
Task 2	Observe memory status using the UCS Manager GUI
Task 3	Observe memory status using the UCS Manager CLI
Activity Verification	Learners will have successfully completed this lab when they have a fully booted, operational server that can ping an external IP address

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Module 2 of 3: Troubleshooting UCS C-Series

Module Objective: Describe troubleshooting processes on the UCS C-Series Standalone

Module 2 Lesson 1 of 5: UCS C-Series Architecture and Configuration

Lesson Objective: Upon completion the student will be able to describe CIMC utilities that enable performance validation and facilitate data gathering activities for UCS C-Series troubleshooting purposes

Module 2 Lesson 1 Topic 1 of 4	Identify UCS C-series Architecture
Topic Objectives	Identify UCS C-series architecture
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review overall UCS C-series system architecture ▪ how UCS C-series components fit together ▪ what is the purpose of each component ▪ what kind of “logic” component has ▪ servers M1/M2/M3 ▪ adapters – VIC P81, CNAs, Ethernet-only, FC-only ▪ cabling options ▪ recognize valid vs. invalid UCS topologies
Sources	DCUCTS with updates

Module 2 Lesson 1 Topic 2 of 4	Understand UCS C-series Configuration
Topic Objectives	Recognize UCS C-series system configuration and normal operation
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review of overall UCS C-series configuration ▪ physical equipment configuration ▪ adapter configuration ▪ BIOS config ▪ understanding CIMC ▪ connectivity requirements ▪ management IP addressing and remote KVM ▪ disrupting vs. non-disrupting configuration changes
Sources	DCUCSTS with updates

Module 2 Lesson 1 Topic 3 of 4	Troubleshoot UCS C-series Initialization
Topic Objectives	Troubleshoot UCS C-series initialization
Media Treatment (Visuals)	Lecture with static slides

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Module 2 Lesson 1 Topic 3 of 4	Troubleshoot UCS C-series Initialization
Content Types or Media Objects	Describe the UCS system initialization processes ▪ discovery of UCS hardware ▪ identify potential failures and errors that can occur upon system initialization/discovery ▪ understand server boot process (quiet boot, Function keys,…) ▪ how to “break-into” server BIOS, ▪ how to “break-into” adapter BIOS ▪ breaking into RAID controller BIOS ▪ OS specific boot aspects ▪ server re-boot/reset/re-acknowledge ▪ RAID specific configuration, troubleshooting and specifics ▪ Boot policy specifics (protected RAID config) ▪ boot issues when replacing failed server and using existing disks
Sources	DCUCSTS with updates + SMEs and TAC personnel input

Module 2 Lesson 1 Topic 4 of 4	UCS C-series Password Recovery
Topic Objectives	Recognize the steps necessary to perform UCS C-series password recovery
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	List the steps and describe the process of password recovery on UCS C-series system.
Sources	DCUCSTS with updates + SMEs and TAC personnel input

Module 2 Activity or Lab 2-1: Cisco Integrated Management Controller (CIMC) Discovery

Item	Description
Activity Objectives	Use CIMC to manage UCS C-series rack-mount server
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Conect to C-series server using CIMC
Task 2	Explore the GUI
Task 3	Review UCS C-series configuration
Task 4	Review system statistics and counters
Task 5	Use remote KVM to connect to server

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Item	Description
Activity Verification	Learners have completed the activity when they have attained these results: • Connect to C-series using CIMC • Make familiar with CIMC • Review existing environment setup • Review system statistics and counters • Review relevant environmental parameters

Module 2 Lesson 2 of 5: Troubleshooting C-series Hardware and Firmware

Lesson Objective: Upon completion the student will be able to describe firmware update and BIOS recovery procedures.

Module 2 Lesson 2 Topic 1 of 5	Identify C-series Firmware
Topic Objectives	Distinguish between individual component firmware
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	C-series UCS firmware download and installation
Sources	DCUCTS with updates

Module 2 Lesson 2 Topic 2 of 5	Host Upgrade Utility
Topic Objectives	Describe the process to download the latest version of the Host Upgrade Utility (HUU) from www.cisco.com
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identifying HUU as the best practice recommendation for upgrading C-series standalone server firmware
Sources	DCUCTS with updates

Module 2 Lesson 2 Topic 3 of 5	Perform the Firmware Upgrade Process
Topic Objectives	Define the general upgrade process for all UCS C-series components
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identifying and resolving firmware failures Server BIOS firmware upgrade prior to OS installation using the CIMC GUI, CLI or HUU. Post OS server BIOS update may be performed using the iFlash utility
Sources	DCUCTS with updates

Module 2 Lesson 2 Topic 4of 5	Troubleshoot UCS C-series Boot
Topic Objectives	Troubleshoot UCS C-series boot process
Media Treatment (Visuals)	Lecture with static slides

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Module 2 Lesson 2 Topic 4of 5	Troubleshoot UCS C-series Boot
Content Types or Media Objects	Describe and troubleshoot C-series boot process ▪ understand server boot process (quiet boot, Function keys,…) ▪ how to “break-into” server BIOS, ▪ how to “break-into” adapter BIOS ▪ breaking into RAID controller BIOS ▪ OS specific boot aspects ▪ RAID specific configuration, troubleshooting and specifics ▪ boot issues when replacing failed server and using existing disks
Sources	DCUCTS with updates + SMEs and TAC personnel input

Module 2 Lesson 2 Topic 5 of 5	Troubleshoot Memory
Topic Objectives	List tools and techniques used to identify memory configuration errors and memory failures including identification of common failures as identified by TAC for C-series
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Memory configuration and failure recognition
Sources	DCUCSTS with updates

Module 2 Activity or Lab 2-2: UCS C-Series Firmware Management

Item	Description
Activity Objectives	Download, install, and activate firmware upgrades by using the C-Series Host Upgrade Utility
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Identify currently installed firmware
Task 2	Acquire firmware
Task 3	Update C-series components
Task 4	Update CIMC
Activity Verification	Learners will have successfully completed this lab when they have installed UCS component firmware and verified proper operation

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Module 2 Lesson 3 of 5: Troubleshooting UCS C-Series LAN & SAN Connectivity

Lesson Objective: Define proper procedures to configure LAN connectivity and avoid issues with the P81E Virtual Interface Card (VIC). Define the proper procedures to configure SAN connectivity and avoid issues with the P81E Virtual Interface Card (VIC).

Module 2 Lesson 3 Topic 1 of 3	Troubleshoot UCS C-series LAN Connectivity
Topic Objectives	Troubleshoot UCS C-series system LAN connectivity
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review overall UCS C-series system LAN connectivity ▪ understand HA options, operation and common errors (mismatch) ▪ Ethernet interfaces – optical vs. copper and common errors/issues, link-level issues ▪ jumbo frames ▪ link level issues ▪ Layer 2 issues
Sources	DCUCTS with updates

Module 2 Lesson 3 Topic 2 of 3	Troubleshoot UCS C-series SAN Connectivity
Topic Objectives	Troubleshoot UCS C-series system SAN connectivity
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Based on previous knowledge review overall UCS C-series system SAN connectivity ▪ FCoE specifics (i.e. FCoE VLAN ID and overlap, …) ▪ FC operation and common errors (mismatch) ▪ FIP ▪ Interface related issues (i.e. isolated interfaces, …) ▪ HBA related specifics and common issues (i.e. WWNN/WWPN assignment, zoning/LUN masking issues, …) ▪ understand HA and related issues ▪ FC UP ports and common errors/issues ▪ Use SPAN to capture traffic traces
Sources	DCUCTS with updates

Module 2 Lesson 3 Topic 3 of 3	Troubleshoot UCS C-series SAN Boot
Topic Objectives	Troubleshoot UCS C-series SAN Boot
Media Treatment (Visuals)	Lecture with static slides

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Module 2 Lesson 3 Topic 3 of 3	Troubleshoot UCS C-series SAN Boot
Content Types or Media Objects	Identify and troubleshoot SAN Boot issues ▪ recognize valid operation and configuration ▪ LUN ID mismatch ▪ Boot policy issues ▪ zoning related issues ▪ HBA specific issues (i.e. WWPN, VSAN mismatch, …)
Sources	DCUCTS with updates

Module 2 Activity or Lab 2-3: Troubleshooting LAN and SAN Connectivity

Item	Description
Activity Objectives	Review proper LAN connectivity of the P81E VIC and correctly configure and verify SAN connectivity by using the P81E Virtual Interface Card (VIC) interfaces
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Review Ethernet (i.e. vNIC) C-series configuration
Task 2	Review FC (i.e- vHBA) C-series configuration
Task 3	Review boot policy and related confiuration
Activity Verification	Learners have completed the activity when they have attained these results: • Connect to CIMC • Review Ethernet part of C-series + verify on the LAN core • Review FC/FCoE part of C-series + verify on SAN core

Module 2 Lesson 4 of 5: Troubleshoot Locally Attached Storage

Lesson Objective: Define RAID controller options and configuration utilities that facilitate the creation of virtual disks that may be used for booting various supported operating systems

Module 2 Lesson 4 Topic 1 of 2	Identify UCS C-series RAID Options
Topic Objectives	Recognize UCS C-series RAID options
Media Treatment (Visuals)	Lecture with static slides

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Module 2 Lesson 4 Topic 1 of 2	Identify UCS C-series RAID Options
Content Types or Media Objects	Based on previous knowledge review overall UCS C-series system local disk and RAID ▪ identify RAID controllers and options ▪ battery backed up cache ▪ RAID levels (0,1,5,6,10,50,60) and requirements ▪ Disk requirements ▪ Disk options (SATA, SAS, SSD) ▪ disk performance aspects i.e. IOPS
Sources	DCUCTS with updates

Module 2 Lesson 4 Topic 2 of 2	Troubleshoot UCS C-series Local Storage
Topic Objectives	Troubleshoot UCS C-series local storage
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify common issues and troubleshoot C-series local storage ▪ RAID configuration ▪ RAID related issues ▪ Disk related issues
Sources	DCUCTS with updates

Module 2 Activity or Lab 2-4: Troubleshooting Local Disk Configuration

Item	Description
Activity Objectives	Become familiar with local disk RAID configuration procedures.
Activity Type	Lab
Visual Objective (Required for Lab)	Graphical Lab Topology
Required Resources	Standard DCUCT Pod configuration
Command List (Required for Lab)	To be based on configuration parameters + GUI
Job Aids	None
Activity Tasks	
Task	**Objective**
Task 1	Access RAID controller configuration
Task 2	Verify RAID controller confoguration
Activity Verification	Learners have completed the activity when they have attained these results: • Connect to CIMC • Connect to RAID controller • Review RAID and local disk configuratoin

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Module 2 Lesson 5 of 5: Troubleshoot Operating System Related Issues

Lesson Objective: Present detailed steps for installing an operating system on both local disks and a remote Fibre Channel SAN LUN, as well as presenting several troubleshooting scenarios and proposed solutions

Module 2 Lesson 5 Topic 1 of 2	Identify C-series OS Specifics
Topic Objectives	Recognize UCS C-series OS related specifics
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify specific related to C-series and various operating systems ▪ where to get various drivers (adapters, RAID, …) ▪ how to install adapters ▪ how to recognize proper driver version
Sources	DCUCTS with updates

Module 2 Lesson 5 Topic 2 of 2	Troubleshoot OS Deployment on C-series
Topic Objectives	Troubleshoot UCS C-series with OS installed
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Identify common issues and troubleshoot C-series driver issues ▪ removing drivers from OS ▪ re-installing drivers ▪ updating OS configuration upon C-series hardware changes ▪ using administratively defined parameters vs. burned-in (i.e. MAC, WWNN, UUID, WWPN, …)
Sources	DCUCTS with updates

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Module 3 of 3: Troubleshooting UCS C-Series Integration

Module Objective: Describe the valid C-series integrated architecture and the process of determining problems related to integration of UCS C-series with UCS Manager

Module 3 Lesson 1 of 3: UCS C-Series and UCS Manager Integration Overview

Lesson Objective: Recognize the architecture and components required for UCS C-series integration with UCS Manager

Module 3 Lesson 1 Topic 1 of 2	UCS C-series Integration Architecture
Topic Objectives	Describe the architecture of Cisco UCS when integrating C-Series into UCS Manager
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize architecture of UCS C-series integration within B-series ▪ topology architecture – components of the setup, how components are connected (FI, FEX, network adapters) ▪ recognize valid vs. invalid topologies
Sources	DCUCTS with updates

Module 3 Lesson 1 Topic 2 of 2	Identify C-series Integration Components
Topic Objectives	Recognize the required components and their interaction for UCS C-Series integration
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize components of C-series integration within B-series ▪ Fabric Interconnect – port licensing and requirements (fixed vs. expansion module based), hard-pinning vs. port-channel mode ▪ UCS Manager –where and how C-series appears in UCS Manager, what needs to be configured in the ▪ Nexus 2232PP FEX for connecting data and management ▪ C-series servers supported in the integrated architecture ▪ C-series adapters and card combinations supported in the integrated architecture ▪ cabling options ▪ software requirements for UCS Manager and C-series CIMC
Sources	DCUCTS with updates, screen captures, configuration guides

Module 3 Lesson 2 of 3: Implement UCS C-Series Integration

Lesson Objective: Configure UCS Manager for C-series integration

Module 3 Lesson 2 Topic 1 of 2	Add C-series to UCS Manager
Topic Objectives	Identify configuration steps and discovery process when adding C-series to UCS Manager

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Module 3 Lesson 2 Topic 1 of 2	Add C-series to UCS Manager
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	List the UCS Manager configuration steps for adding C-series server. Review the UCS Manager discovery process when adding C-series server and Nexus 2232PP. Observe the FSM output upon discovery/add operation of C-series
Sources	DCUCTS with updates

Module 3 Lesson 2 Topic 2 of 2	Verify C-series Integration
Topic Objectives	Verify proper operation of C-series integration
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Use the UCS Manager to review the C-series integration ▪ verify the visibility and operation of Nexus 2232PP, interface status and counters ▪ verify C-series server visibility and operation, network adapter status, remote KVM operation, inventory
Sources	DCUCTS with updates, screen captures, configuration guides

Module 3 Lesson 3 of 3: Troubleshoot UCS C-Series and UCS Manager Integration

Lesson Objective: Troubleshoot the UCS C-Series server integration with UCS Manager

Module 3 Lesson 3 Topic 1 of 2	Troubleshoot Connectivity Configuration
Topic Objectives	Verify cabling and port configuration for C-series integration connectivity
Media Treatment (Visuals)	Lecture with static slides
Content Types or Media Objects	Recognize proper C-series cabling setup and common mistakes Recognize proper port configuration (i.e. role) and common mistakes Use UCS Manager to review mismatched cabling and port configurations (i.e. review interface status and logs in mismatched/wrong setup)
Sources	DCUCTS with updates

Module 3 Lesson 3 Topic 2 of 2	Troubleshoot Software Compliance
Topic Objectives	Verify software versions for C-series integration
Media Treatment (Visuals)	Lecture with static slides

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Module 3 Lesson 3 Topic 2 of 2	Troubleshoot Software Compliance
Content Types or Media Objects	Examine software version for CIMC and UCS Manager and verify proper versions. Identify software upgrades (with the process itself) that are necessary for proper operation i.e. upgrading the C-series firmware to be compatible with UCS Manager using host update utility, upgrading UCS B-series to be compatible for C-series integration.
Sources	DCUCTS with updates, screen captures, configuration guides

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