

Administering Cisco UCS X-Series Solutions with Intersight

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Course Number: INTUCSX-NTO

Duration: 5 days

Overview

Course Description

This advanced technical training delivers in-depth expertise on the Cisco UCS X-Series server family and Cisco Intersight, emphasizing deployment, operations, migration, optimization, and integrated hardware/software solutions. Cisco UCS X-Series represents the latest generation of converged computing solutions optimized for hybrid and cloud-native workloads critical for modern enterprises focusing on agility, workload portability, automation, and resource optimization. By attending this intensive 5-day course, participants will acquire comprehensive knowledge and practical skills required to successfully deploy, configure, optimize, operate, and troubleshoot Cisco UCS X-Series platforms integrated through Cisco Intersight. This course is crucial for Infrastructure teams, Data Center professionals, Systems Engineers, Solutions Architects, AI/ML Infrastructure Designers, and technical leads responsible for implementing and managing hybrid datacenter/computing environments leveraging Cisco UCS-X technology, Intersight management, container platforms (Red Hat OpenShift), and GPU-enhanced AI infrastructure. Prerequisites: Participants should possess basic-to-intermediate knowledge of Cisco UCS platforms, data center technologies, server infrastructure, networking concepts, virtualization fundamentals, and basic container management proficiency.

Skills Gained

Upon completion of this course, the student will be able to meet these overall objectives:

- Understand, describe, and configure Cisco Intersight (on prem and SaaS models)
- Understand, describe, and configure Intersight Advanced features (IST, ICO, IWOM)
- Understand, describe, and configure IMM and UMM mode for UCS
- Understand, describe, and configure Cisco X-Series (FI, IFM, X210c Server, Adv Fabric Module)
- Create Intersight Pools, Policies, and Management for X-Series
- Design and operate Cisco UCS with Intersight Managed Mode Solutions

Audience

Course Details

Day 1: Cisco UCS X-Series Solution Architecture & Key Components Module 1: Cisco UCS X-Series and Intersight Solution Architecture

- Cisco UCS-X 5th Generation overview and architecture details
- Cisco Intersight SaaS and on-prem management overview
- UCS-X chassis (X9508), compute nodes (X210c M6/M7, X410c M7)
- Fabric Interconnects (6400, 6500 models Gen 4, Gen 5)
- Networking and storage infrastructure options

Module 2: Cisco Intersight Foundation

- Introduction to Cisco Intersight (cloud and on-prem architecture, SaaS model) vs legacy UCSM
- Intersight foundational elements: GUI navigation, inventories, profiles, policies, firmware baselines
- Core features: IMM-mode principles, pools, policies, templates
- Intersight Licensing
- Lab 0: Connecting to Lab Environment
- Lab 1: Exploring Cisco Intersight Interface and Setting Up IMM in Cisco Intersight
- Lab 2: Initial UCS-X Hardware Setup, component inventory, and IMM discovery

Module 3: Cisco UCS X-Series Management with Intersight Managed Mode (IMM)

- Configuring Pools, Policies (Firmware, Server, Network, Storage)
- Service profiles and templates management with Intersight

- Intersight Infrastructure Services & troubleshooting overview
 - Lab 3: Configuring UCS-X with Intersight IMM Profiles, Policies & Templates
- Day 2: Installation, Migration, and Advanced Operations Module 4: UCS X-Series Installation Considerations

- Detailed IMM deployment procedures, prerequisites, planning
- Migration strategies from classic UCS Manager to IMM/Intersight
- Cisco Intersight IMM Transition Tool deployment and operations
- Lab 4: Migration and Validation using Cisco Intersight IMM Transition Tool

Module 5: Advanced Day-2 Operations in Intersight

- Firmware lifecycle management & best practices
- Advanced resource optimization: Server, storage, network
- Monitoring, logging, alerts, and automated remediation
- Lab 5: Firmware management, monitoring, and Day-2 operational tasks

Module 6: UCS-X Power & Cooling Management

- Airflow optimization, thermal policy management
- Advanced power policies and future-proof cooling best practices
- Lab 6: Configure advanced thermal and power policies

Module 7: Structured Troubleshooting Approach with Intersight and CLI

- Troubleshooting fabric connectivity, IOM, vNIC/vHBA, and bandwidth issues
- Firmware and configuration issues; logs and CLI analysis techniques
- VLAN, VSAN, QoS, and CRC error troubleshooting
- Lab 7: Hands-on troubleshooting using CLI and Intersight GUI

Day 3: Red Hat OpenShift Integration with Cisco UCS-X and Intersight Module 8: Deployment Considerations for Managing Container Platforms with Red Hat OpenShift Clusters

- UCS-X Hardware requirements for OpenShift deployment (compute, storage, network)
- Designing robust network fabric and storage for container platforms
- Provisioning OpenShift clusters through Cisco Intersight
- Lab 8: OpenShift Deployment using Cisco-validated methodologies

Module 9: Operational Management of Red Hat OpenShift on UCS-X

- Managing OpenShift lifecycle (upgrade, updates, node scaling) via Intersight
- Cross-platform observability, integration, and resource optimization
- Lab 8: OpenShift Operations through Intersight Automation

Day 4: AI Infrastructure Design, GPU Deployment & Optimization Module 10: AI/ML Infrastructure Planning & GPU Integration with Cisco UCS-X

- GPU technology overview (Nvidia Ampere/Hopper architectures, CUDA cores, VRAM types)
- Selecting the right GPUs: performance, required quantities per workload, supported UCS-X GPUs/adapters
- Optimizing GPU-to-server ratios for typical AI model/training scenarios
- Lab 9: Validating GPU Performance, Monitoring GPU health and resource utilization in Intersight

Module 11: GPU Optimization and Best Practices

- GPU virtualization and orchestration via VMware/Nutanix/OpenShift/Kubernetes
- GPU tuning parameters for AI workloads (multi-instance GPU, vGPU modes)
- Troubleshooting GPU resource allocation and infrastructure bottlenecks
- Lab 10: Optimization for GPU-intensive workloads and troubleshooting GPU deployment

Day 5: Advanced Cisco Intersight Topics & API Automation Module 12: Intersight API Integration and Automation Overview

- Cisco Intersight REST API fundamentals, architecture, authentication and endpoint exploration
- Automating Intersight operations via REST API, Ansible Modules, Terraform Providers
- Developing customized automation scripts and workflows with Cisco-provided SDKs (Python, PowerShell)
- Practical automation: typical workflows and SDK use-case demonstrations

Module 13: Advanced Cisco UCS-X and Intersight Topics

- Automated workload optimization and resource recommendations
- Partner Solution: IBM Turbonomic
- Hybrid Kubernetes cluster orchestration and container workload management
- Cisco Intersight Kubernetes Service (IKS)
- Infrastructure automation via Infrastructure-as-Code methodologies
- Cisco Intersight Service for Terraform (IST)

- Workflow and orchestration automation
- Intersight and ACI Application Profiles
- Design and operation of automated workflows
- Cisco Intersight Cloud Orchestrator (ICO)
- Advanced Forecasting and Optimization Tools in Cisco Intersight
- Resource usage prediction, infrastructure health analytics and recommendations
- Unified Observability with AppDynamics, ThousandEyes & Splunk
- Real-time insights and predictive analytics for seamless digital performance
- Other Third-Party Integrations

Lab Outline:

- Lab 1: Initial UCS-X Hardware Setup, component inventory, and IMM discovery
- Lab 2: Configuring UCS-X with Intersight IMM Profiles, Policies & Templates
- Lab 3: Migration and Validation using Cisco Intersight IMM Transition Tool
- Lab 4: Firmware management, monitoring, and Day-2 operational tasks
- Lab 5: Configure advanced thermal and power policies
- Lab 6: Hands-on troubleshooting using CLI and Intersight GUI
- Lab 7: OpenShift Deployment using Cisco-validated methodologies
- Lab 8: OpenShift Operations through Intersight Automation
- Lab 9: Validating GPU Performance, Monitoring GPU health and resource utilization in Intersight
- Lab 10: Optimization for GPU-intensive workloads and troubleshooting GPU deployment

Bonus Labs

- Lab 11: Implementing and Troubleshooting RBAC using the Intersight API
- Lab 12: Utilizing Intersight Workload Optimizer (IWO) or IBM Turbonomic use cases demo

Lab 4: Nutanix Integration in Cisco UCS

- Configure and manage Nutanix solutions within a Cisco UCS setup.

Lab 5: Cisco UCS X-Series Configuration with Intersight

- Deploy and configure the UCS X-Series using Intersight, focusing on IMM features.

Lab 6: Designing LAN and SAN Connectivity for UCS

- Set up and validate LAN and SAN connectivity configurations in a UCS environment.
- Lab 7: Managing UCS-X in IMM Mode

- Configure and manage UCS-X in IMM mode, including server profiles and policies.

Lab 8: Firmware Management in Cisco UCS-X with Intersight

- Perform firmware updates in UCS-X using Intersight, applying IMM methodologies.

Lab 9: Utilizing Intersight Workload Optimizer (IWO)

- Explore and apply the Intersight Workload Optimizer in UCS management scenarios.

Lab 10: Orchestrating Workflows with Intersight Cloud Orchestrator (ICO)

- Create and manage workflows in ICO, utilizing Terraform and Ansible for automation.

Lab 11: Implementing Automation with Intersight API and Ansible

- Introduce the use of Ansible playbooks for automation in UCS with Nutanix. Provide examples where Ansible can simplify repetitive tasks.

Lab 12: Objective: Using the Intersight API for automation tasks, focusing on Python scripting

- Focus on Python scripting to use the Intersight API for automation, providing use cases such as deploying a Nutanix cluster or performing health check.

Lab 13: Troubleshooting Connectivity and Performance in Intersight-Managed UCS Environments

- Techniques for diagnosing and resolving connectivity and performance issues in UCS environments managed by Intersight, with an emphasis on IMM and ICO tools.

Lab 14: AI-Powered Systems Management

- Hands-on lab with scenarios for implementing AI-driven forecasting and optimization.
- Using Intersight and IMM to manage a simulated data center environment.