



Cisco - ACI Operations and Troubleshooting v3.1

Code:	ACIOPS v3.1
Length:	5 days
URL:	View Online

The Cisco ACI Operations and Troubleshooting (ACIOPS v3.1) is a five (5) day course that reviews topics that are covered extensively in the Data Center Application Centric Infrastructure Fundamentals (DCACIFv3.1) course. The course covers the basic concepts of the graphical user interface (GUI) setup of the fabric. The focus is on building Tenants, VRF's, Bridge Domains, EPG's and Contracts based on a practical design. The physical, VMM, L2 and L3 Domains and a good understanding of the flow of the GUI is paramount in applying this knowledge in automation. The programmability of Cisco ACI is also reviewed in this course, specifically the REST and JSON APIs, and the APIC Object-Based Tree and dMIT queries. This course also includes some advanced operational features such as, firmware upgrades, performing backups, snapshots, and rollbacks. We will also examine how to use fault health checks and other ACI troubleshooting tools.

Skills Gained

Upon completing this course, you will be able to meet these objectives:

- Cisco ACI Component Review: Cisco ACI solution design review
- Cisco ACI Operations: Know how to administrate and troubleshoot advanced Cisco ACI operations
- Cisco ACI Troubleshooting: Be proficient at advanced Cisco ACI troubleshooting
- Cisco ACI Automation: Understand the Cisco ACI network programmability
- Cisco Backups, Snapshots, Rollbacks and Upgrades: Understand the Cisco ACI redundancy and upgrade features

Who Can Benefit

This course is designed for network professionals looking for the following:

- Automating Cisco-based Data Center and Cloud Infrastructures, Cloud Infrastructure Architects, Pre-Sales System Engineers, Field and Network Engineers and Specialists.
- Network professionals who want to master Cisco ACI.
- IT and network managers who want to understand ACI to make informed upgrade and refresh decisions to their DC network infrastructures as well as be able to articulate these decisions to the upper level management.
- Network and IT managers who want to understand the business and technical benefits of moving to Cisco Application Centric Infrastructures.
- Professionals who are preparing for the CCIE DC ACI.

Prerequisites

It is recommended that each student has the following knowledge and skills before attending this course:

- CCNP DataCenter (or higher) knowledge and/or experience.
- For all candidates it is highly recommended that they have previously attended the Skyline Data Center Application Centric Infrastructure Fundamentals (DCACIF v2 or v3) course or Configuring Cisco Nexus 9000 Switches in ACI mode (Cisco DCAC9K v2 or v3).

Course Details

Outline

Module 1: Cisco ACI Component Review

Lesson 1: Cisco ACI Architecture and Network Review

- ACI and APIC Review
- Tenant, Management Tenant and Context Review
- VLAN and VRF Review
- Bridge Domain Review
- Application Profile Review
- End Point Group Review

Lesson 2: Cisco ACI Policy Review

- ACI Contract Review
- ACI Filter Review
- ACI Subject Review

Lesson 3: Cisco ACI Unified Fabric Review

- Cisco ACI Server Connectivity Review
- Cisco ACI Network Connectivity Review
- Cisco ACI Switch Review
- Cisco ACI Routing Review

Lesson 4: Cisco ACI External Connectivity Review

- Layer 2 External Switching Review
- Layer 3 External Routing Protocol Review

Lesson 5: Customer Setup Review

- Scaling Cisco ACI
- Migration Paths to Cisco ACI

Module 2: Cisco ACI Operations

Lesson 1: The Cisco ACI Control Plane and Packet Flow

- Determine ACI Packet Flow
- Single DB/Single EPG with Two Endpoints on the Same Leaf
- Single BD/Single EPG with Two Endpoints on Different Leafs
- Single BD/Two EPGs with One Endpoint in EPG on the Same Leaf
- Two BDs/Two EPGs with One Endpoint in Each EPG on the Same Leaf (Routed Packet)

Lesson 2: Cisco ACI Router Baseline

- Route Profiles Overview
- Configuring a Route-Profile
- Applying a 'Default' Route-Profile
- Applying a Route-Profile at the Bridge Domain
- Applying a Route-Profile at the Bridge Domain Subnet
- Applying a Route-Profile at the External EPG and External EPG Subnet
- Applying a Route-Profile at the L3out as an Interleak Policy

Lesson 3: Configure and Verify Changes in the Network

- Configure and Verify Interface Profiles
- Configure and Verify Static EPGs
- Verify Interfaces and Encapsulation

Lesson 4: Cisco ACI Logging and DHCP Relay

- Logging data and data retention
- Activity and audit logs
- DHCP Relay service
- Infra/Tenant
- L3 Out
- L2 Out

Module 3: Cisco ACI Troubleshooting

Lesson 1: Cisco ACI Troubleshooting Tools

- Atomic Counters and Network Time Protocol
- Cisco ACI Endpoint Tracker Application
- End to End Testing
- Endpoint to Endpoint Testing
- Endpoint Group to Endpoint Group Testing
- Discovering Paths and Testing Connectivity with Traceroute

Lesson 2: On-Demand Diagnostics and Statistics

- Gathering On-Demand Collection and Statistics
- Cisco Switched Port Analyzer (SPAN)
- Access SPAN (or infrastructure SPAN)
- Fabric SPAN
- Tenant SPAN
- ACI Monitoring and Diagnostics
- Fabric Troubleshooting Diagnostics

Lesson 3: Cisco Nexus Data Broker Integration with ACI

- The Cisco Nexus Data Broker
- Test Access Points (TAPs)
- Configure SPAN Sessions
- Synchronize SPAN Sessions
- Data Broker Use Case

Lesson 4: Cisco ACI Troubleshooting Methodology and Scenarios

- Techsupport Files
- Atomic Counters
- Faults and Health Scores
- Troubleshooting Scenarios
- Troubleshoot Fabric Initialization
- Troubleshoot APIC High Availability and Clustering
- Troubleshoot Firmware and Image Management
- Troubleshoot Management Tenant
- Troubleshoot Common Network Services
- Troubleshoot Unicast Data Plane Forwarding and Reachability
- Troubleshoot Policies and Contracts
- Troubleshoot Bridged Connectivity to External Networks
- Troubleshoot Routed Connectivity to External Networks
- Troubleshoot Virtual Machine Manager Insertion
- Troubleshoot Layer 4 Through 7 Services Insertion
- Troubleshoot ACI Fabric Node Process Crash Troubleshooting
- Troubleshoot an APIC Process Crash

Module 4: Cisco ACI Automation

Lesson 1: The REST API

- The REST API Structure
- The Six Constraints of REST
- REST Client-Server Constraint
- REST Stateless Constraint

- REST Cacheable Constraint
- REST Layered Constraint
- REST Code-On-Demand Constraint
- REST Uniform Interface Constraint

Lesson 2: JSON and XML

- JSON API Characteristics
- XML API Characteristics
- JSON and XML Advantages, Similarities, and Differences

Lesson 3: Cisco ACI Data Model

- The Cisco ACI Programmable Network Infrastructure
- The APIC Data Model
- The APIC Policy Model
- The Cisco ACI Object-Oriented Data Model

Module 5: Cisco ACI Backups, Snapshots, Rollbacks and Upgrades

Lesson 1: Cisco ACI Backups, Snapshots and Rollbacks

- Backing up Configurations
- Snapshots
- Rollbacks

Lesson 2: Cisco ACI Upgrades

- Firmware Repository
- Software Image
- Switch Image
- Catalog Image

Module 1 Lab Exercises

- Lab 0 - Lab Topology and Access
- Lab 1 - Reviewing the Cisco ACI Environment
- Lab 2 - Tenant and Context
- Lab 3 - VLAN and VRFs
- Lab 4 - Bridge Domains
- Lab 5 - Application Profiles
- Lab 6 - End Point Groups
- Lab 7 - External Bridged Networks
- Lab 8 - External Routed Networks
- Lab 9 - Physical and VMM Domains

Module 2 Lab Exercises

- Lab 10 – ACI Packet Flows
- Lab 11 - Verify Routing Information

Module 3 Lab Exercises

- Lab 12 – ACI Monitoring Tool
- Lab 13 – Using Statistics
- Lab 14 – Configure Syslog Monitoring
- Lab 15 – Configure ERSPAN
- Lab 16 – Create and Test an EPG-to-EPG Atomic Counter
- Lab 17 – Using the Moquery Command
- Lab 18 – Configure and Verify Contracts
- Lab 19 – Examine and Enhance Fabric Access Policies

Module 4 Lab Exercise

- Lab 20 – Configure the APIC Using the REST API

Module 5 Lab Exercises

- Lab 21 - Backups and Snapshots
- Lab 22 - Create and Use Configuration Backups
- Lab 23 – Instructor Led Break / Fix Lab

Appendix (Optional Labs)

- Lab 24 – Explore Spanning Tree Protocol and Loop Prevention
- Lab 25 – APIC Cluster Operations and Troubleshooting
- Lab 26 – Nexus Spine and Leaf Switch Operations
- Lab 27 – Upgrade APIC and Switch Firmware

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