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## Cisco ACI Operations Boot Camp

DURATION: 5 DAYS

COURSE CODE: ACIOPSBC

FORMAT: LECTURE/LAB

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### COURSE DESCRIPTION

This 5-day boot camp is the most comprehensive ACI course in the industry. This class is focused on real-world operations of ACI with the added benefit of exploring the most common issues found within ACI and examining how to troubleshoot those issues. This boot camp builds on core concepts in Software-Defined Networking (SDN) with an application-focused, policy-based model for orchestrating network service deployment.

This course is designed for Operations teams, customers, systems engineers, and field engineers who are implementing and managing Cisco ACI but will also be involved with troubleshooting ACI implementations. We will cover the key concepts behind ACI's application-centric, policy-based view of infrastructure. You will learn how ACI Managed Objects interoperate and how ACI tenants, application profiles, contracts, and endpoints, influence the ACI Fabric. We will explore strategies used to connect to external networks and services, and how to configure hypervisor integration and L4-7 services. Once the students have fully examined the interworking of ACI, we will explore troubleshooting methodologies and available tools for analyzing and solving common ACI problems.

### WHO SHOULD ATTEND

This course is tailored for end-user, Operations, network and Data Center architects and engineers, as well as senior IT personnel who are involved with ACI implementations on a day-to-day basis and will be responsible for troubleshooting ACI and its interaction with attached devices.

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### PREREQUISITES

IT professionals who already possess a strong working knowledge of Data Center networks will gain the most from this course. This course would be beneficial to those who have been working with ACI, or who will be responsible for implementing and troubleshooting ACI fabric topologies.

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### LEARNING OBJECTIVES

Provide an Overview of the Cisco Application Centric Infrastructure (ACI) solution

Provide an overview of the Application Policy Infrastructure Controller (APIC)

Review Layer 4 through Layer 7 Services

Provide an overview of the Cisco Application Centric Infrastructure solution

Provide an overview of how to connect ACI to outside networks

Provide an overview of how to implement ACI management  
Describe common topology options for integrating ACI with existing data centers

Identify troubleshooting issues around the APIC

Describe options for troubleshooting L2 and L3 forwarding within the ACI Fabric

Discuss troubleshooting scenarios in the Common Tenant and Management Tenant

Explain ways to rectify common VMM issues

## COURSE OUTLINE

### 1. Introduction to ACI

- ACI Anywhere
- ACI Simplicity
- New Ways of Networking
- ACI in the Cloud
- Advantages of a Policy Driven Design
- ACI Value to Business

### 2. ACI Overview

- ACI Nexus 9000 Series Switches
- Cisco 9000 Series FEX Support
- ACI Concepts and Principles
- Differentiate between Policy and the Network
- Tenants Contexts and Bridge Domains
- Endpoint Groups
- Application Profiles
- Contracts, Subjects, and Filters
- Endpoint Group Options
- Granular Application Isolation with EPGs
- Intra EPG Isolation VMM Domains
- Intra-EPG Contracts for DVS and Bare Metal
- Microsegmentation and Intra-Endpoint Group Isolation with Endpoint Groups

### 3. Describing the ACI Fabric

- Leaf and Spine Single-Site Topology
- The Use of Overlays in ACI
- Unicast Forwarding
- Multicast Forwarding within the ACI
- FCOE NPV support
- Flowlet Dynamic Load-Balancing
- Health Scores
- Faults and Events
- Troubleshooting Tools and Wizard
- Maintenance Mode (Graceful Decommission)
- Failure Scenarios

### 4. Configuring the APIC

- Explaining the APIC
- Fabric Initialization and Discovery
- ACI Configuration Interfaces
- Bringing Up ACI
- APIC Maintenance (Backups/ Snapshots)
- First Hop Security
- Two-Factor Authentication
- 802.1x Support (Single-Host Mode)

### 5. Configuring Layer 4-7 Services

- Service Insertion and Redirection
- Service Graphs
- Policy-Based Redirect
- Copy Features of a Service Graph

### 6. Configuring APIC Hypervisor Integration

- Policy Coordination with VM Managers
- Configuration Integration with VMware
- Integration with Microsoft Hypervisors
- VMM Domain/ OpFlex support for Kubernetes

### 7. Configuring ACI Connectivity to Outside Networks

- Inside and Outside Network Policies
- Configuring Layer 3 Outside Connections
- Configuring Layer 2 Outside Connections
- L3 EVPN Services Over Fabric WAN
- Migrating to ACI
- Multiple Data Centers

### 8. APIC Troubleshooting

- APIC High Availability and Clustering
- Faults / Health Scores
- Policies and Contracts

### 9. L2 and L3 Troubleshooting

- Unicast Data Plane Forwarding and Reachability
- Bridged Connectivity to External Networks
- Routed Connectivity to External Networks

### 10. Tenant Troubleshooting

- Management Tenant
- Common Network Services

### 11. VMM Troubleshooting

- Virtual Machine Manager Insertion

## DISCOVERY LABS

- 1: Access the Remote Lab Environment
- 2: Familiarize Yourself with the GUI
- 3: Configure Basic Network Constructs
- 4: Attaching Internal Compute and adding the VMM Domain
- 5: Configure External Layer 2 to Internal ACI Communication
- 6: Creating a Two-Tier Application
- 7: Configuring External Layer 2 to Internal ACI Communication
- 8: Configuring External Layer 3 to Internal ACI Communication
- 9: Exporting Contracts between Tenants
- 10: Using the APIC Visibility and Troubleshooting Tool
- 11: Exploring the Use of the ACI APIC CLI
- 12: APIC Troubleshooting
- 13: Troubleshooting Policies and Contracts
- 14: Mapping out Unicast Data Plane Reachability
- 15: L2 and L3 Troubleshooting
- 16: Tenant Troubleshooting
- 17: VMM Troubleshooting
- 18: Troubleshooting Fabric Access Policies
- 19: Troubleshooting Sets of Unknown Failures