

## Lumos 5-Day ACI Field Engineer and Operations Training Agenda

### Day 1:

- **ACI Overview:** Evolution of the modern Data Center. From the traditional 3-Tier architecture to the Spine-Leaf Architecture and why the industry is moving to VxLAN and to the policy-driven Data Center.
- **ACI Switching Hardware:** Review of the Nexus 9000 ACI switching platform.
- **Cisco's Application Policy Infrastructure Controller (APIC):** How the Cisco APIC provides fabric configuration and Application Network Policy creation and deployment with built-in redundancy, scalability and monitoring
- **APIC Fabric Discovery and Configuration:** Explore how Cisco ACI provides zero touch fabric discovery and configuration, walk through fabric setup, discuss design considerations, and best practices.
- **ACI Polices and Resource Pools:** Cover the why and how of creating and using ACI policies and resource pools, discuss design considerations and best practices to make Day-2 operations and management more efficient.  
**Lab:** Initial Configuration of ACI Polices and Pools

### Day 2:

- **ACI Tenant Logical Polices:** Configuration of logical tenant constructs including Tenants, VRFs, Bridge Domains, Application Profiles and End Point Groups.  
**Lab:** Configuring ACI Tenant and Access polices
- **Fabric Operation and Forwarding:** How does the fabric operate? Go under the covers and see how packets are learned and forwarded inside the fabric. Discover how ACI can connect to bare metal servers or hypervisors running VLAN, VxLAN, NVGRE and forward packets seamlessly between any of these encapsulations.
- **Hypervisor Integration with ACI:** Explore various methods to integrate industry standard Hypervisors (ESXi, KVM, Hyper-V), their integration with ACI and an overview of Application Virtual Edge (AVE).  
**Lab:** Configure VMM and Validate End Point Learning  
**Lab:** Communication Using Contracts
- **Routing with ACI:** Introduction to ACI Layer-3 connectivity, transit routing, route leaking, shared L3-Out, contracts and ACI routing protocols.  
**Lab:** Routing Outside of ACI

### Day 3:

- **Lab:** Advanced Communication with Contracts
- **Extending Layer 2:** Walk through the methods of extending Layer-2 switching out of ACI including static path binding, L2-Outs, contracts, spanning-tree and design considerations and common ACI migration scenarios.  
**Lab:** Extending Layer 2 to Existing Networks and ERSPAN
- **Application Centric vs. Network Centric Design:** Explain the different models of ACI logical topologies, EPG/ESG security and design considerations and application dependency mapping.
- **L4-L7 Devices:** Explore ACI L4-L7 service chaining and insertion using firewalls, load balancers and other service appliances.  
**Lab:** Policy Based Redirect (PBR) in ACI
- **Microsegmentation, Security and Analytics:** Discover how the ACI security model allows for enhanced DC security features like Microsegmentation, the various implementations in ACI and other products and analytics tools

## Day 4:

- **Migration Scenarios and Methodology:** Walk through greenfield and brownfield migration scenarios from legacy networks to ACI, ACI MultiPod and ACI MultiSite topologies.  
**Lab:** Advanced Security using ESGs
- **ACI Programmability Concepts:** Explore the Model Object Tree structure and the various methods and data formats capable of interacting with ACI APIs including Visore, APIs, Python, XML, JSON & RESTful architecture.  
**Lab:** Using Postman to Interact with ACI
- **Save/Post Method:** Discover how you can use the ACI Save and Post method along with a text editor to quickly make changes in your environment.
- **API Runners:** Examine how using Postman and API Runners can be utilized to make large changes to your ACI environment very quickly and easily.  
**Lab:** Deploying with Postman
- **Python, Cobra SDK, Arya:** Students will get an Introduction to Python, the Cisco Cobra SDK and Arya and some real-world examples of how Python scripting can be used to automate everything from small changes to large deployments.  
**Lab:** Automating ACI with Python: Students will create a Python script to use in the lab and can build upon this experience to develop their own scripts in their own environments.
- **Ansible:** Discover how Ansible can make changes and deployments easier without any scripting experience.  
**Lab:** Automating ACI with Ansible: Students will create everything needed to make a simple ACI deployment using Ansible.

## Day 5:

- **Day-2 Operations:** Examine the challenges for Day-2 Operations in modern DCs, explore the tools that ACI offers both internally and externally to optimize DC operations.
- **ACI Troubleshooting Methodology:** Learn troubleshooting methodology specific to ACI traffic flow and policy configuration from APIC to endpoint.
- **Troubleshooting the ACI Logical Model:** Explore how to troubleshoot the ACI policy model (configuration issues).
- **Troubleshooting the ACI Concrete Model:** Discuss various methods to troubleshoot the concrete model at the individual switch level.  
**Lab:** Verification of VLANs  
**Lab:** Endpoint Tracking and Verification:
- **Troubleshooting VMM Integration:** Examine how and where to troubleshoot common issues to VMM integration.  
**Lab:** ACI Policy Break/Fix
- **Troubleshooting L3Outs:** Learn common issues with L3Outs and how to troubleshoot and resolve them.