

COURSE OVERVIEW:

SD-Access and Catalyst 9k Programmability Workshop (SDA9KPW) v1.0 discusses SD-Access and the Cisco Catalyst 9000 Series switch programming. In this course you will learn about production solutions that run on or interact with IOS-XE on the Catalyst 9000 switches. We will also discuss how to position the Cisco tools including DNA Center, APIC-EM, ISE, Network Data Platform to implement SD-Access.

WHO SHOULD ATTEND:

The primary audience for this course is as follows:

- Anyone interested in SD-Access and the Catalyst 9000
- Channel Partner SEs and other sales support
- Personnel involved in SD-Access Design and Implementation
- Network Operations team with SD-Access solution
- Network admin staff that deal with Software Defined Networking
- Network Administrators
- Network Architects
- Network Engineers

PREREQUISITES

It is recommended, but not required, that students have the following knowledge and skills:

- Familiar with Catalyst 9k Switches

COURSE OBJECTIVES

Upon completing this course, the learner will be able to meet these overall objectives:

- Describe use cases and examples of the value of Catalyst 9000 programmability
- Learn about Python and how it automates the Catalyst 9000
- Understand hpe object-oriented programming in Python to abstract Catalyst 9000
- Understand SD-Access
- Discuss how to apply Cisco Software-Defined Access programmatically



COURSE OUTLINE:

Module 1: Positioning SD-Access and Overview

- What is end-to-end segmentation
- Simple, automated work flows
- Open and Programmable APIs
- Intelligent network fabric
- Use Cases
 - Security and segmentation
 - User mobility
 - Guest access
 - IoT integration
 - Monitoring and troubleshooting
- Cisco Catalyst 9000 Series Programmability
- Components
 - DNA Center
 - Catalyst 9000 Switches
 - APIC-EM
 - ISE
 - Network Data Platform
- Key concepts of Integrations
 - IP Address Management (IPAM)
 - Network Orchestrators
 - Policy Orchestrators
 - Security Analytics
 - Firewalls
 - Public and Private Cloud Integration
 - IT Services Management (ITSM)

Module 2: Cisco DNA Programming Basics

- IOS XE
- Understanding REST API
- Python and IOS XE
- Cisco Python Module

- Use cases
 - Automated Provisioning
 - A glance at common errors
- High level overview: REST API

Module 3: Catalyst 9000 Automation

- NETCONF with SDN controllers
- OpenConfig
- YANG data models
- Guest Shell Linux Containers (LXCs)
- Cisco network plug-and-play
- Zero-touch provisioning
- Python scripting and custom libraries
- Use Cases
 - IT Operations
 - Analytics
 - PCI Compliance

Module 4: Software Defined Networks

- SD-Access
- VXLANs
- MP-BGP EVPN
- Use case
 - Extending Layer to Branch Offices
 - Business Continuance

Module 5: APIC-EM

- SD-Access and APIC-EM
- Use Cases
 - Network Threat Defense
 - Granular Control
 - Smart Routing
- Catalyst 9000 Integration
- APIC-EM Automation
- APIC-EM APIs

Module 6: Cisco DNA Center to Manage Your Network

- Components
- Benefits
- Automation

Module 7: Cisco SD Access Programming

- Network Fabric
- Cisco SD-Access
- Use Cases
 - Network Deployment
 - End-to-End Segmentation
 - Simple, Automated Workflows
 - Intelligent Network Fabric
- Cisco SD-Access Hardware and Software Platform Requirements
- Centralized Control and Management Plane

Module 8: SD-Access Wireless and WAN Programming

- Visibility of Wireless Traffic for Consistency
- Centralized Control/Management
- Intelligent Services Automation (Application Visibility & Control, EasyQoS)
- Network Embedded Threat/Anomaly Detection and Mitigation
- Intelligent WAN
- Use Cases
 - Accelerate Wireless Deployment
 - Enable Secure Access
 - Deploy branch offices quickly
 - Reduce costs and mitigate risks

LAB OUTLINE

- Calling REST APIs from Python
- Programming the Catalyst 9300
- Software Defined Networks on Catalyst 9300
- APIC-EM Automation
- Setup Cisco DNA Center
- Setup Overlay and one Neighborhood
- Moving Users to Cisco SD-Access Fabric
- WAN Migration
- Enable Mobility Services