

# Course Outline

## SD-Access and Catalyst 9k Programmability Workshop Course SDA9KP: 2 days Instructor Led

*All Cisco courses are delivered by a Cisco Authorized Platinum Learning Partner*

### About this course

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.

### Audience profile

- 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

### At course completion

After completing this course, students will be able to:

- 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

## Course Outline

- 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 (LXC's)
- Cisco network plug-and-play
- Zero-touch provisioning
- Python scripting and custom libraries
- Use Cases
  - IT Operations
  - Analytics

## Course Outline

- 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

## Course Outline

- 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