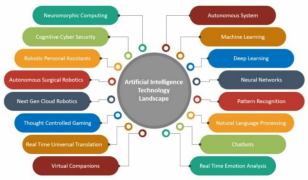

SHI Programmability Integration Fundamentals 3 Days Instructor LED User Guide

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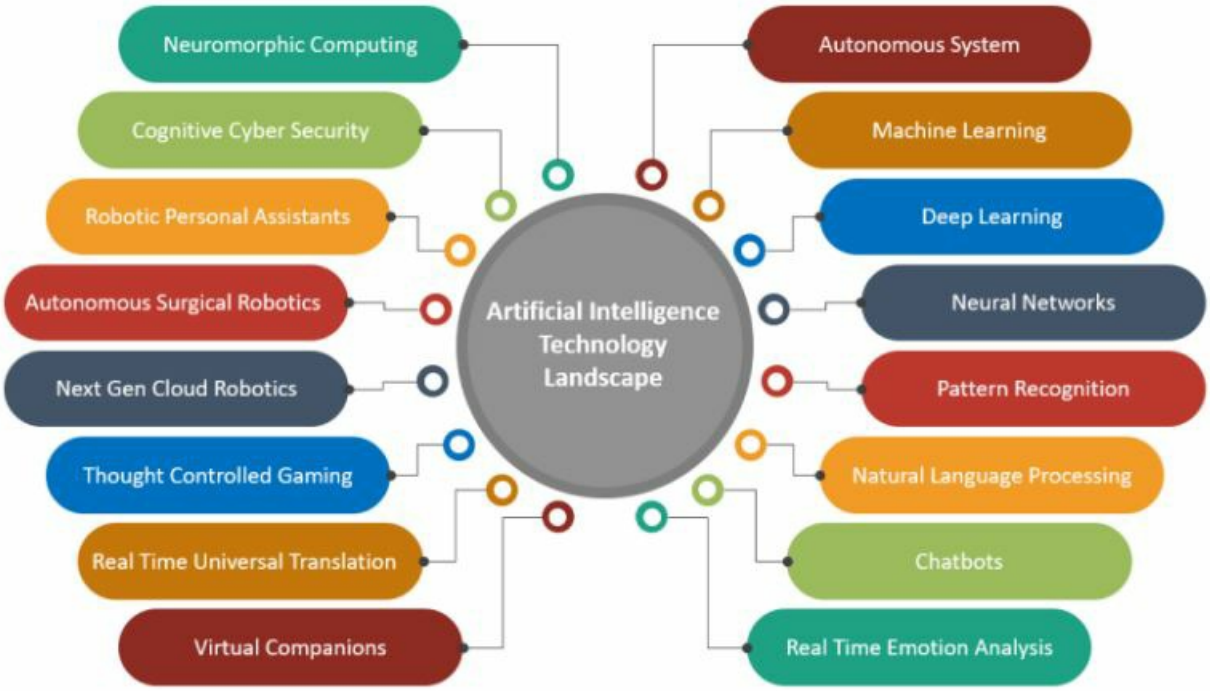

Product Information

Specifications

- Course Name: DNA Center, SD-Access, and Catalyst 9k Programmability Integration Fundamentals
- Course Code: DNACPF
- Duration: 3 days
- Delivery Method: Instructor Led
- Authorized Partner: Cisco Authorized Platinum Learning Partner

About this Course

“Cisco DNA Center Programmability Integration Fundamentals” is a 3-day, instructor-led course that focuses on programmable infrastructure concepts and integrations supporting Cisco SDAccess, DNA Center, and the Cisco Catalyst 9000 Series switch programming. The course provides insights into production solutions that run on or interact with IOS-XE on the Catalyst 9000 switches.

Course Outline

- Design
- Provision
- Policy
- Assurance

Module 4: SDA Center Ecosystems Integrations

- ITSM Integrations
- Client Insights with Apple Analytics

- IP Address Management (IPAM)
- Network Orchestrators
- Policy Orchestrators
- Security Analytics
- Firewalls
- Public and Private Cloud Integration

Course Outline

DNA Center, SD-Access, and Catalyst 9k Programmability Integration Fundamentals Course DNACPF: 3 days Instructor Led
All Cisco courses are delivered by a Cisco Authorized Platinum Learning Partner

Audience profile

- 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 what is SDN and Network Programmability
- Describe use cases and examples of Catalyst 9000 programmability
- Learn about Python and how it automates the Catalyst 9000
- Understand object-oriented programming
- Understand SD-Access
- Discuss how to apply Cisco Software-Defined Access programmatically
- Understand the Use Cases and Problems Solved with SDN programmability
- Explain an overview of OpenFlow and Network Controllers
- Explain an overview of Human Interaction DevOps-Style

Course Outline

Module 1: SD-Access Introduction

- SDA Quick Overview
- SDA Key Benefits
- Technical Overview
    - LISP
    - Cisco Trustsec
    - VXLAN

- Network Fabric
- SDA Overlay Key Components
    - Control Plane
    - Data Plane
    - Policy Plane
- SDA Fabric Roles & Terminology
    - DNA Controller
    - Identity Services
    - Analytics Engine (NDP)
    - Control Plane
    - Edge Nodes
    - Border Nodes
    - Virtual Network
    - Scalable Groups
    - VXLAN Encapsulation

Module 2: SDA Wireless Architecture

- SDA Wireless Architecture Overview
- SDA Wireless Benefits
- Policy Rollout
- Wireless Integration in SDA Fabric

Module 3: SDA Deployment

- Digital Network Architecture
- Campus Fabric Automation
- Smart CLI
- Programmable APIs
- DNA Center – SD-Access WorkFlow
    - Design
    - Provision
    - Policy
    - Assurance

Module 4: SDA Center Ecosystems Integrations

- Event Notifications and Webhooks
- Integrations Overview
- DevOps Integrations
- ChatOps Integrations
- Use Cases
    - ITSM Integrations
    - Client Insights with Apple Analytics

    - IP Address Management (IPAM)
    - Network Orchestrators
    - Policy Orchestrators
    - Security Analytics
    - Firewalls
    - Public and Private Cloud Integration
- DNA Center Architecture
- Cisco DNA Assurance Introduction
- DNA Assurance Architecture
- Telemetry Collection Overview
- DNA Assurance Getting Started
- Full Stack Visibility
- Network & Client Experience
- Intelligent Capture
- Real Time Monitoring RF
- Path Trace
- Sensor-based Proactive Monitoring
- Application Experience
- Issue Remediation
- AI Network Analytics
- Machine Reasoning

Module 6: Python Programming

- Programmability Overview
- APIs Primer
- Python Foundation Overview
- Lists, Tuples & Dictionaries
- Control Sentences
- Functions
- Modules
- Classes
- Error Handling (Exceptions)

Module 7: Programming SDA and DNA Center

- DNA Center Architecture Overview
- DNA Controller
- DNA Center Automation
- DNA Center APIs
- Building DNA Center Applications

Module 8: Cisco Catalyst 9K Introduction

- Intent Based Networking
- Cisco Catalyst 9K Features and Characteristics
- Cisco Catalyst 9K IOS-XE
- Catalyst 9K Platform Support
- Linux Service Containers Introduction
- Python Programmability Introduction
- Zero-Touch Provisioning, iPXE, PnP
- CLI – Legacy, Python CLI, Guest Shell

Module 9: Catalyst 9K and Cisco Application Framework

- Cisco Application Framework / Virtual Service Infra (IOX)
- Cisco Catalyst 9K Application Hosting
- Application Hosting Value Proposition
- Catalyst 9K Switching Application Ecosystem
- Virtual Machines
- KVMs
- Containers
    - General LXC (Linux Service Containers)
    - GuestShell (pre-packaged LXC)
- Other pre-packaged LXCs, ie PerfSonar
- Python Programmability in Depth
- Python API
- Zero Touch Provisioning (ZTP) and Plug ’n Play

Module 10: Catalyst 9K EEM Python Module
• EEM Overview
• Python Scripting in EEM
• EEM Python Package
• Python-Supported EEM Actions
• EEM CLI Library Command Extensions

Module 11: Data Models & Model-Driven Programmability

- Why Models are Important
- YANG data models
    - Native models
    - IETF models
    - OpenConfig models
- Data Encoding
    - XML
    - JSON
- YANG Tools
    - YANG Explorer
    - YANG Catalog

    - Pyang
- NetConf
    - History
    - Protocol layers
    - Operations
    - Messages
    - Using NetConf
- RESTConf
    - History
    - Protocol layers
    - Operations
    - Messages
    - Using RestConf
- Telemetry Introduction

Module 12: Model Driven Telemetry

- Yang Data Streaming
- Telemetry History
- gRPC
- Collectors & Renderers
- ELK
    - Elastic Search
    - Logstash
    - Kibana
- TIG
    - Telegraph
    - Influx
    - Grafana
- Quick Start with Docker
- Publication Types
- Telemetry Subscriptions
- IOS-XE 16.x and 17.x Yang Model Support
- Yang Model Metadata
- CLI and XML Configuration Examples
- Pipeline
- Splunk

Module 13: 3rd Party Integrations

- ServiceNow
- Splunk

Lab Outline:

- Lab 1: Intro DNA Center
- Lab 2: DNA Assurance
- Lab 3: DNA Center API Discovery
- Lab 4: Setup Machine for Development
- Lab 5: Python Overview
- Lab 6: Programming Cisco DNA Center
- Lab 7: Managing the Guest Shell
- Lab 8: Running Python Scripts as Part of EEM Applet Actions
- Lab 9: NETCONF/RESTConf
- Lab 10: YANG Data Modeling & YANG Explorer, YANG Catalog and pYANG
- Lab 11: Catalyst 9K – Application Hosting
- Lab 12: Programming Telemetry
- Lab 13: Integrating DNAC with ServiceNow
- Lab 14: Integrating DNAC with Splunk

Documents / Resources

	**SHI Programmability Integration Fundamentals 3 Days Instructor LED** [pdf] User Guide Programmability Integration Fundamentals 3 Days Instructor LED, Integration Fundamentals 3 Days Instructor LED, Fundamentals 3 Days Instructor LED, Days Instructor LED, Instructor LED , LED

References

- **User Manual**