Implementing Automation for Cisco Service Provider Solutions (SPAUI)

Course Duration: 24 Hours **Course code: SPAUI**

1. Course Overview

The SPAUI course equips Service Provider engineers with the skills to automate, program, and manage large-scale network infrastructures using next-gen technologies like YANG, NETCONF, RESTCONF, gRPC/gNMI, and orchestration platforms such as NSO and ESC. Traditional CLI-based approaches are replaced with scalable, error-free, and programmable workflows, enabling engineers to manage thousands of devices with minimal effort and maximum reliability.

Learners gain hands-on experience with real-world use cases, automation frameworks, telemetry, and infrastructure-as-code tools like Ansible, NetMiko, and Python scripting. You'll also explore traffic engineering and NFV lifecycle management with Cisco-specific platforms like WAE, ESC, and XTC.

2. What you'll learn?

After completing this course you shoud be able to:

- Use NETCONF and RESTCONF programmability protocols on Cisco devices
- Describe and use tools to validate YANG data models on Cisco devices
- Describe and configure model-driven telemetry on Cisco devices
- Describe and configure network traffic automation with Cisco XTC
- Describe and use network automation tools that utilize SSH
- Automate service provider network configuration with Cisco NSO
- Describe how to automate virtualized resources with Cisco ESC

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- Describe how to automate service provider WAN with Cisco WAE

3. Target Audience

Individuals looking to use network programmability to scale and streamline Service Provider network infrastructure.

4. Pre-Requisites

Attendees should meet the following prerequsites:

- CCNP equivalent level of knowledge for Routing and Switching (R&S)
- Cisco Internetworking Operating System (IOS XE) and Cisco IOS XR working experience
- SP Operations experience with routing, Multi-Protocol Label Switching (MPLS) and Virtual Private Network (VPN) Solutions
- Network Programmability Basics (Network Programming Foundations, APIs and Protocols, Network Model Driven APIs and Protocols, Configuration Management with Ansible, Service Provider Network Automation workflows)

Recommended prerequisites:

- SPCOR - Implementing and Operating Cisco Service Provider Network Core Technologies

5. Course content

Implementing Network Device Programmability Interfaces with NETCONF and RESTCONF

- Implement NETCONF Protocol
- Implement RESTCONF Protocol

Implementing Model-Driven Programmability with YANG

- YANG Data Models
- YANG Tools
- YANG Development Kit

Implementing Model-Driven Telemetry

- Implementing Model-Driven Telemetry with gRPC
- Implementing Model-Driven Telemetry with Gnmi

Automating Service Provider Network Traffic with Cisco XTC

- Cisco XTC Fundamentals
- Configure Cisco XTC

Automating Networks with Tools That Utilize SSH

- Implement Device Configurations with Python Netmiko Library
- Implement Device Configurations with Ansible Playbooks

Orchestrating Network Services with Cisco NSO

- Cisco NSO Fundamentals
- Cisco NSO Device Manager
- Cisco NSO Services
- Implement Device Configurations with Python

Automating Virtualized Resources with Cisco Elastic Services Controller

- Cisco ESC Architecture
- Cisco ESC Resource Management

Automating the WAN with Cisco WAE

- Describe the Cisco WAE Components