Implementing Automation for Cisco Service Provider Solutions (SPAUI) v1.0

What you'll learn in this course

The **Implementing Automation for Cisco Service Provider Solutions (SPAUI)** v1.0 course prepares you to implement and support automation solutions in a Service Provider network infrastructure, using network programmability principles, protocols, tools, and mechanisms. Through a combination of lessons and hands-on labs, you will learn to deploy, configure, monitor, and operate Service Provider network environments using modern data models. These models allow you to represent operational data and new network management protocols in order to administer hundreds or thousands of devices in a single operation, replacing traditional, time-consuming, error prone, device-by-device Command Line Interface (CLI) management. The course also introduces powerful automation solutions that can streamline network operations.

This course covers Yet Another Next Generation (YANG) data models and validation tools, Representational State Transfer Configuration Protocol RESTCONF and Network Configuration Protocol (NETCONF) management protocols, model-driven telemetry with Google Remote Procedure Call (gRPC) and Google Network Management Interface (gNMI), traffic automation with XR Transport Control (XTC), Secure Shell (SSH)-based automation tools like NetMiko and Ansible, orchestration provided by Network Services Orchestration (NSO), Network Function Virtualization (NFV) lifecycle management with Elastic Services Controller (ESC), and network operations automation with WAN Automation Engine (WAE).This course prepares you for the **300-535 Automating and Programming Cisco® Service Provider Solutions (SPAUTO)** exam.

Introducing Automation for Cisco Solutions (CSAU) is required prior to enrolling in **Implementing Automation for Cisco Service Provider Solutions (SPAUI)** because it provides crucial foundational knowledge essential to success.

Course duration

- Instructor-led training: 3 days in the classroom
- Virtual instructor-led training: 3 days of web-based classes
- E-Learning: Equivalent to 3 days classroom instruction

How you'll benefit

This course will help you:

- Use network programmability to scale and streamline Service Provider network infrastructure
- Gain hands-on experience in using modern data models to manage Service Provider network infrastructure
- Prepare for the **300-535 SPAUTO** exam

What to expect in the exam

The **300-535 SPAUTO** exam certifies your knowledge and skills related to implementing service provider automated solutions, including programming concepts, orchestration, programming OS, and automation tools.

After you pass **300-535 SPAUTO**, you earn the **Cisco Certified DevNet Specialist - Service Provider Automation and Programmability** certification, and you satisfy the concentration exam requirement for these professional-level certifications:

- CCNP® Service Provider
- Cisco Certified DevNet Professional

Who should enroll

This course is designed for Service Provider networking professionals in job roles such as:

- Network administrators
- Network architects
- Network designers
- Network engineers
- Network managers
- Network Operations Center (NOC) personnel
- Network supervisors

How to enroll

- For instructor-led training, visit the Cisco Learning Locator.
- For private group training, visit Cisco Private Group Training.
- For e-learning, visit the Cisco Learning Network Store.
- For digital library access, visit Cisco Learning Library.

Technology areas

- Network Automation
- Service Provider

Course details

Objectives

After taking this course, you should 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
- Describe how to automate service provider WAN with Cisco WAE

Prerequisites

Before taking this course, you should have the following knowledge and skills:

- CCNP equivalent level of knowledge for Routing and Switching (R and 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)

The following Cisco courses can help you gain the knowledge you need to prepare for this course:

- **Introducing Automation for Cisco Solutions (CSAU)**
- **Implementing and Operating Cisco Service Provider Network Core Technologies (SPCOR)**
- **Implementing Cisco Service Provider Advanced Routing Solutions (SPRI)**
- **Implementing Cisco Service Provider VPN Services (SPVI)**

Outline

- 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

Lab outline

- Explore NETCONF Protocol in Cisco Devices
- Configure Cisco IOS XE Devices with RESTCONF
- Explore Cisco and OpenConfig YANG Data Models with YANG Tools
- Use ncclient and Python to Configure Cisco Devices
- Use YANG Development Kit (YDK) to Configure Cisco Devices
- Configure Model-Driven Telemetry with gRPC
- Configure Model-Driven Telemetry with gNMI
- Configure Path Disjointness with Cisco XTC
- Use Python Netmiko Library to Configure Cisco Devices
- Use Ansible to Configure Cisco Devices
- Use Cisco NSO Device Manager
- Create a Loopback Service Template
- Use Cisco NSO REST API with Postman
- Explore and Use Cisco WAE Features

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