

Course Outline

Introducing Automation for Cisco Solutions

Course CSAU: 3 days Instructor Led

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About this course

Introducing Automation for Cisco Solutions (CSAU) is a 3-day course gives students a broad overview of network automation skills. Through a combination of lecture and hands-on labs, you will learn the fundamentals of automation such as working on model-driven programmability solutions with Representational State Transfer Configuration Protocol (RESTCONF) and Network Configuration Protocol (NETCONF) protocols. The course also covers data formats and types, including Extensible Markup Language (XML), JavaScript Object Notation (JSON), Yaml Ain't Markup Language (YAML), and Yet Another Next Generation (YANG), and their value in network automation, along with DevOps tools such as Ansible and Git.

Audience profile

- Automation architect
- Automation engineer
- Consulting systems engineer
- DevOps engineer
- Network administrator
- Network architect
- Network consulting engineer
- Network design engineer
- Network engineer
- Network operator
- Network reliability engineer
- Sales engineer
- Site reliability engineer
- Systems engineer
- Technical solutions architect

At course completion

After completing this course, students will be able to:

- Articulate the role network automation and programmability play in the context of end-to-end network management and operations
- Define and differentiate between waterfall and agile software development methodologies
- Interpret and troubleshoot Python scripts with fundamental programming constructs built for network automation use cases
- Describe how DevOps principles, tools, and pipelines can be applied to network operations
- Understand the role of network automation development environments and associated technologies such as Python virtual environments, Vagrant, and Docker
- Understand and construct HTTP-based API calls to network devices
- Articulate the differences among and common use cases for XML, JSON, YAML, and protobuf
- Construct and interpret Python scripts using the Python requests module to automate devices that have HTTP-based APIs
- Understand the role YANG plays in network automation

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- Understand that a number of tools exist to simplify working with YANG models
- Describe the functionality of RESTCONF and NETCONF and the differences between them
- Construct Ansible playbooks to configure network devices and retrieve operational state data from them
- Build Jinja2 templates and YAML data structures to generate desired state configurations

Course Outline:

- Examining Network Management and Operations
- Exploring Software Development Methodologies
- Using Python for Network Automation
- Describing NetDevOps: DevOps for Networking
- Managing Automation Development Environments
- Introducing HTTP Network APIs
- Reviewing Data Formats and Data Encoding
- Using Python Requests to Automate HTTP-Based APIs
- Exploring YANG
- Using YANG Tools
- Automating Model-Driven APIs with Python
- Introducing Ansible for Network Automation
- Templating Configurations with Jinja2

Lab Outline:

1. Use Network Automation Scripts
2. Enforce Python Fundamentals on the Interactive Interpreter
3. Automate Networks with Netmiko
4. Troubleshoot Python Scripts
5. Use the Git Version-Control System and Collaborate on an Internal Project
6. Manage Merge Conflicts
7. Build Reproducible Automation Environments
8. Use HTTP-Based APIs with Postman
9. Explore YAML and JSON Data
10. Consume HTTP-Based APIs with Python Requests
11. Explore YANG Tools
12. Explore NETCONF with Python
13. Explore RESTCONF with Python
14. Configure Network Devices with Ansible
15. Collect Network Data with Ansible
16. Build and Deploy Configurations with Ansible