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Cisco CCIE Automation Certification Training

5 days (35 hours)

Overview

The Cisco CCIE Automation certification validates advanced expertise in the design, development, deployment, and troubleshooting of complex network automation solutions within Cisco environments.

This Cisco CCIE Automation training course prepares you for the skills assessed in the 350-901 AUTOCOR exam and the CCIE Automation Practical Exam. It covers the entire lifecycle of an automation solution, from design through operation and troubleshooting.

You will learn to develop advanced automations using Python, leverage Cisco APIs and programmable interfaces, and scale your infrastructure with Ansible, Terraform, and Infrastructure as Code. You will also master YANG, NETCONF, RESTCONF, pyATS, and the telemetry mechanisms required for validating and monitoring infrastructure.

The course also covers containerization, API and secret security, Git and CI/CD workflows, and troubleshooting complex automation solutions. Hands-on exercises will help you develop a methodology tailored to the requirements of the 8-hour CCIE Automation Practical Exam.

Upon completion of this course, you will be able to design, automate, test, secure, and troubleshoot complex Cisco infrastructures and will have the skills necessary to prepare for the exams leading to Cisco CCIE Automation certification.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Design and deploy advanced network automation solutions
- Develop workflows using Python, APIs, NETCONF, RESTCONF, and YANG
- Standardize infrastructure with Ansible, Terraform, and Infrastructure as Code
- Automate infrastructure testing and validation with pyATS and telemetry
- Secure, containerize, and integrate automation solutions into CI/CD workflows
- Diagnose complex environments and prepare for the CCIE Automation Practical Exam

Target Audience

- Network Automation Engineers
- Experienced network engineers
- NetDevOps and DevOps engineers
- Network Architects
- Cisco experts specializing in infrastructure automation

Requirements

- Advanced proficiency in IP networking and Cisco technologies
- Very strong programming skills in Python
- Hands-on experience with REST, NETCONF, RESTCONF, and YANG APIs
- Experience with automation and Infrastructure as Code tools such as Ansible and Terraform
- Practical knowledge of Git, CI/CD, Docker, and Linux environments
- Completion of the [Cisco CCNP Automation certification](#) or equivalent skills is a strong plus
- Significant experience in the design, deployment, operation, and troubleshooting of network automation solutions is strongly recommended

Note: Ambient IT does not own Cisco certifications. These certifications belong to Cisco Systems, Inc.

Cisco CCIE Automation Certification Training Program

[Day 1 - Morning]

Design and deploy advanced automation solutions

- Design a solution for on-premises, hybrid, and cloud environments
- Consider maintainability, modularity, virtual machines, containers, and orchestration
- Ensure high availability, resilience, and scalability of automation solutions
- Master performance constraints: latency, rate limiting, CPU, memory, and inter-service communications
- Modify an existing solution based on business and technical requirements and a single source of truth

- Use Git and CI/CD to version, test, and deploy automation solutions
- Hands-on workshop: Design the architecture of a resilient automation solution and implement its Git and CI/CD workflow.

[Day 1 - Afternoon]

Industrializing Infrastructure with Infrastructure as Code

- Design an Infrastructure as Code strategy tailored to technical and operational constraints
- Automate the configuration and deployment of resources with Ansible and Terraform
- Organizing variables, inventories, modules, resources, dependencies, and infrastructure states
- Leverage control mechanisms, conditionals, loops, and plugins in automation workflows
- Use NETCONF, RESTCONF, and REST API interfaces to manage infrastructure
- Maintain the desired state and manage discrepancies between the expected configuration and the actual infrastructure
- Hands-on workshop: Build an Infrastructure as Code solution combining Ansible, Terraform, and Cisco programmable interfaces.

Automate and program Cisco network infrastructures

- Develop Python scripts to automate network operations and leverage Cisco APIs
- Automate the configuration of Cisco IOS XE and NX-OS devices
- Configure interfaces, VLANs, routing, ACLs, and other network settings using programmable interfaces
- Utilize YANG models and model-driven programmability mechanisms
- Create, modify, and troubleshoot automated tests with pyATS
- Design model-driven telemetry solutions to collect and analyze operational data
- Hands-on workshop: Automate the configuration of a Cisco infrastructure and then validate its status with Python, YANG, and pyATS.

[Day 2 - Morning]

Containerizing and Orchestrating Automation Solutions

- Create and optimize images with Docker and Dockerfile
- Packaging the components of an automation solution and managing their dependencies
- Deploy and connect multiple services with Docker Compose
- Understand the orchestration principles required for deploying automation applications
- Configure and troubleshoot Docker networks, volumes, and inter-container communication
- Analyze performance and connectivity issues between applications, microservices, and network infrastructure
- Hands-on workshop: Containerize a multi-service automation solution and diagnose its network communications.

[Day 2 - Afternoon]

Securing network automation solutions

- Integrate secure development principles into automation scripts, APIs, and workflows
- Identify and fix key application vulnerabilities based on OWASP
- Manage the certificates, keys, and encryption mechanisms required for secure communications
- Implement authentication and authorization mechanisms appropriate for APIs
- Protect tokens, credentials, and secrets used by automation pipelines and tools
- Apply the principle of least privilege and secure communication between automated components
- Hands-on workshop: audit and then strengthen the security of an automation solution that exposes an API and handles secrets.

Operate, troubleshoot, and prepare for the CCIE Automation Practical Exam

- Diagnose application and network performance issues using logs, metrics, and assurance data
- Identify failures related to CI/CD pipelines, APIs, scripts, dependencies, and automation tools Automation
- Analyze issues related to CPU, memory, databases, asynchronous requests, and communications between microservices
- Implement a structured troubleshooting approach on a complex automated infrastructure complex
- Review the topics covered in the 350-901 AUTOCOR and the CCIE Automation Practical Exam v1.1
- Prepare a strategy for the 8-hour practical lab: requirements analysis, time management, validation, and troubleshooting
- Hands-on workshop: complete a CCIE simulation combining design, automation, deployment, validation, and troubleshooting of a complex infrastructure.

Target Audience

This training is intended for both individuals and companies—large or small—seeking to train their teams in new, advanced IT technologies or to acquire specific industry knowledge or modern methodologies.

Pre-training Assessment

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency level across various types of technologies, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth operation of the training session.

Teaching Methods

Hands-On Workshop: 60% Hands-On, 40% Theory. Training materials distributed in

digital format to all participants.

Organization

The course alternates between theoretical input from the instructor—supported by examples and reflection sessions—and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.