Cisco NSO Advanced for Python Programmers (NSO300) Training

Duration: **5 Day**

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The **Cisco Network Services Orchestrator (NSO) Advanced for Python Programmers (NSO300) v4.0** course builds on the knowledge and skills developed in **NSO Essentials for Programmers and Network Architects (NSO201) v4.0**.

Participants learn how to extend NSO capabilities by customising templates with Python, deploying NSO in Docker environments, and developing advanced service structures with Nano Services.

The course uses the NSO Application Framework and Python scripting to create advanced services for both new and existing **Layer 3 Multiprotocol Label Switching (MPLS) VPN** deployments. Learners also explore methods for managing and scaling these services more efficiently.

The programme examines how Virtualized Network Functions (VNFs) can reduce dependence on physical hardware while supporting more flexible and efficient service architectures.

Participants also work with **Network Functions Virtualization (NFV)** orchestration capabilities and learn how **Cisco Elastic Services Controller (ESC)** can be used to manage the lifecycle of virtualized network functions.

How You Will Benefit

This training helps participants:

- Tailor Cisco Network Services Orchestrator solutions to match organisational requirements
- Manage Virtualized Network Functions in a more automated, efficient, and dynamic way
- Build advanced network services using Python and the NSO Application Framework
- Scale service orchestration more effectively
- Develop a stronger understanding of NFV-based service architectures

Prerequisites

Cisco recommends that participants have knowledge and skills equivalent to those covered in **Cisco Network Service Orchestrator (NSO) Essentials for Programmers and Network Architects (NSO201) v4.0**.

Participants should also have basic knowledge of:

- The command line in UNIX-like operating systems
- Network Configuration Protocol (NETCONF)
- Yet Another Next Generation (YANG) data modelling
- Python software development

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What You Will Learn

By the end of this course, participants will be able to:

- Describe the NSO Application Framework
- Deploy NSO in Docker containers
- Implement Python- and template-based services
- Explain service lifecycle integration
- Describe the implementation of a Layer 3 MPLS VPN service for a new deployment
- Implement Nano Services
- Describe the implementation of a Layer 3 MPLS VPN service for an existing deployment
- Explain Managed Services
- Implement Stacked Services
- Describe approaches for scaling service orchestration
- Explain the European Telecommunications Standards Institute Management and Orchestration (ETSI MANO) Framework
- Manage the VNF lifecycle using Cisco ESC
- Implement NFV orchestration

Training Outline

1. Discovering the NSO Application Framework

- NSO Transaction Model
- Mapping options
- Overview of the NSO Python API

2. Deploying NSO in Docker Containers

- Comparing different NSO deployment approaches
- Overview of running NSO in Docker

3. Developing Python and Template-Based Services

- Service strategy
- Service design
- Service modelling
- Applying Python and templates to service development

4. Integrating the Service Lifecycle

- Overview of the service lifecycle
- Service lifecycle integration options
- Integrating services with operational processes

5. Developing a Layer 3 MPLS VPN Service for a New Deployment

- Service strategy
- Service design
- Layer 3 MPLS VPN service model

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- New service deployment considerations

6. Developing Nano Services

- Nano Services concepts
- Working with Nano Service structures
- Manual resource allocation within service design

7. Developing a Layer 3 MPLS VPN Service for an Existing Deployment

- Existing service deployment strategy
- Existing service deployment design
- Managing existing service structures with NSO

8. Introducing Managed Services

- Overview of Managed Services
- Resource allocation
- Core managed service concepts

9. Implementing Stacked Services

- Stacked Services strategy
- Implementing Resource-Facing Services
- Combining multiple service layers

10. Scaling Service Orchestration

- Optimisation options
- Layered Services Architecture design
- Scaling orchestration across larger service environments

11. Discovering the ETSI MANO Framework

- Network Functions Virtualization Initiative
- ETSI MANO
- NFV management and orchestration concepts

12. Managing the VNF Lifecycle with Cisco ESC

- Introduction to Cisco Elastic Services Controller
- VNF Lifecycle Management
- Managing Virtualized Network Functions

13. Orchestrating NFV

- Introduction to the NFV Orchestration (NFVO) Bundle
- VNF Descriptor
- NFV service orchestration