Cisco DevNet Automation Bootcamp for NSO

Cisco Training Bootcamps for individuals and small teams

Real-world training for today's IT professional

Cisco Training Bootcamps are 9-day intensive training programs, delivered over 8 weeks for groups of up to 12 learners, that will help you optimize your network. This course provides an overview of NSO as a network automation solution, as well as introductions to NETCONF, YANG, and XPath.

The 4-day deep-dive Labs emphasize hands-on labs that map practical skills to real-world scenarios. Leading the 4-day deep-dive lab are two Cisco Developer Advocates skilled in automation development, APIs, and NSO. These two subject-matter experts will answer questions, clarify lab instructions, and guide students through the immersive experience.

How you'll benefit

This course will help you:

- Learn to install Cisco® Network Services Orchestrator (NSO)
- Practice configuring devices with NSO
- Practice designing and managing services with YANG models
- Gain confidence with NSO configuration
- Apply DevOps best practices for Cisco NSO operations
- Using NSO within a CI/CD pipeline

Prerequisites

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

- Basic knowledge of the Cisco Command-Line Interface (CLI) or the CLI of UNIX-like operating systems

- Working knowledge of UNIX-based operating systems and basic tasks

- Basic knowledge of programming constructs and YANG data modeling

- Basic knowledge of Python programming

- Basic knowledge of the NETCONF communication protocol

- Knowledge of XML data structures and schemas

- Basic management of network components (routers, switches, etc.)

Bootcamp components

- Kick-off document
  Self-study prerequisite materials provided to help you get a head start and prepare for the training

- 5-day instructor-led training
  In-depth Cisco training, including hands-on labs that focus on the foundational concepts you need to know

- Self-study materials
  To help reinforce the knowledge from the 5-day training and help you prepare for the deep-dive lab

- 4-day instructor-led, deep-dive lab
  Dynamic, hands-on training using end-to-end, deep-dive labs to build your confidence and skills

- Office hours support
  Three 2-hour support sessions conducted using a Webex space
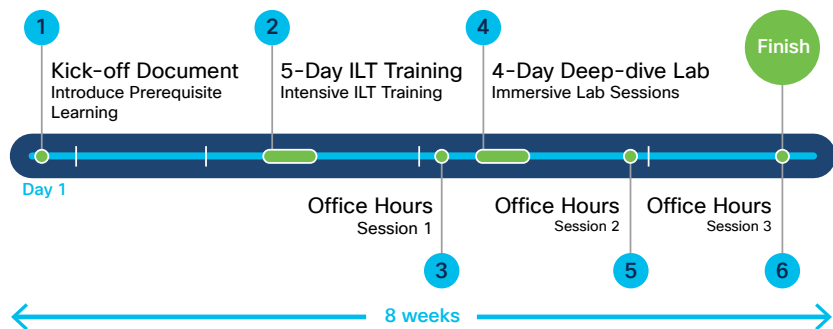
Technology areas

- Software Defined Networking
- Network Automation
- Service Provider

Continuing Education credits

You can earn Cisco [Continuing Education Credits](#) with any Cisco Training Bootcamp and use your credits toward recertification. The Cisco Operations and Troubleshooting Bootcamp for NSO is worth 50 Continuing Education credits.

Cancellation Policy

Cancellation of enrollment within 30 days of the course start date will result in a charge of 100% of the listed class price.

5-day ILT: Outline

The Cisco DevNet Automation Bootcamp for NSO 5-day ILT training course introduces you to Cisco® Network Services Orchestrator (NSO). You will learn to install Cisco NSO and use it to manage devices and create services based on YANG templates with XPath.

You will learn about managing devices and creating device templates, service management and service package creation, network element drivers, interfacing with other systems using APIs, configuring and troubleshooting system settings, managing alarms and reporting, configuring NSO for scalability and performance, and capabilities that can be added to Cisco NSO. This course introduces modern DevOps concepts and tools, such as Git and Continuous Delivery/Continuous Deployment (CI/CD).

- Section 1: Introducing Service Orchestration with Cisco NSO
- Section 2: Exploring Cisco NSO Architecture
- Section 3: Orchestrating Network Solutions
- Section 4: Describing Cisco NSO Operation
- Section 5: Installing Cisco NSO
  - Lab: Install Cisco NSO
- Section 6: Exploring the Advantages of NETCONF
- Section 7: Managing Devices Using the Device Manager
  - Lab: Use Device Manager
  - Lab: Create a Device Template
- Section 8: Creating YANG Models
- Section 9: Using Services
  - Lab: Create a Loopback Template Service
- Section 10: Implementing Services with Model-to-Model Mapping
  - Lab: Create a VLAN Template Service
- Section 11: Designing Services in Cisco NSO
  - Lab: Create an L3VPN Template Service
- Section 12: Managing the Service Lifecycle
  - Lab: Migrate a CDM Device
- Section 13: Programming with Python in Cisco NSO
  - Lab: Set Up Device Using Python Scripts
  - Lab: Create an SVI Python-Template Service
- Section 14: Configuring and Troubleshooting System Settings
- Section 15: Discovering Cisco NSO Northbound APIs
  - Lab: Use NSO RESTCONF API with Postman

- Section 16: Managing Alarms and Reporting
- Section 17: Configuring Cisco NSO for Scalability and Performance
- Section 18: Describing Cisco NSO VNF Manager and Function Packs
- Section 19: Describing Software Development Methodologies
- Section 20: Explaining Version Control System
  - Lab: Learn to Work with Git
- Section 21: Describing Continuous Integration and Continuous Delivery
  - Lab: Use NSO in Docker

4-day deep-dive lab: Outline

The Cisco DevNet Automation Bootcamp for NSO 4-day deep-dive labs continue to build upon the 5-day training. Each student works from a dedicated lab environment with their own NSO installation. Using both the NSO CLI and Northbound APIs for automation, the students will administrate, configure, and develop their own MPLS Layer 3 VPN service. The labs were designed with balance in mind. The idea is to blend working on your own with opportunities to co-develop with Cisco Developer Advocates.

You will start Day 1 with a refresher in CLI skills for NetSim and NSO network devices. During Day 2 you will apply configurations with device templates and automation. Each day will build on the previous day. For example, in Day 2 we will advance from configuring network devices to configuring network services and from observing state with CLI show commands to Model Driven Telemetry. Day 3 is all about applying the skills learned in the 5-day virtual instructor-led training (NETCONF, YANG, and Xpath) to developing service packages and their key components (python mappings, YANG parameters, and service templates).

But we don't stop there; we incorporate automation to build and manage services from the Northbound APIs. Day 4 wraps everything together with DevOps best practices for developing NSO code and services. You will also learn how to use Git for version control, how to package your code, and how to deploy into environments using CI/CD pipelines with PyATS automated testing and verification.

Day 1
- Section 1: Confirm Environment
- Section 2: Populating the NSO Device Inventory
  - Lab: Populating the NSO Device Inventory
- Section 3: Exploring the NSO CLI
  - Lab: Exploring the NSO CLI

Order Bootcamps

To order Cisco Training Bootcamps, contact your BDM at learning-bdm@cisco.com.

Day 2

- Section 4: Automating with Device Templates
  - Lab: Automating with Device Templates
- Section 5: Introduction to Network Services
  - Lab: Introduction to Network Services
- Section 6: Introduction to Model-Driven Telemetry

Day 3

- Section 7: Consuming Model-Driven Telemetry
  - Lab: Enabling and Consuming Model-Driven Telemetry
- Section 8: Building a Template-Based Service
  - Lab: Building a Template-Based Service
- Section 9: Driving NSO through Northbound APIs
  - Lab: Driving NSO through Northbound APIs

Day 4

- Section 10: CI/CD Pipelines in Infrastructure Automation
- Section 11: Introduction to Version Control
- Section 12: Build with GitLab
- Section 13: Testing with pyATS
- Section 14: ROBOT
- Section 15: CI/CD Pipeline in Action
  - Lab: Using NSO within a CI/CD Pipeline