# NSO Essentials for Programmers and Network Architects

**Duration: 4 Days** **Course Code: NSO201** **Version: 3.0** **Delivery Method: Virtual Learning**

## Overview:

This course provides a brief overview of the NSO solution, NETCONF, YANG, and XPath. After this overview, the course focuses on service creation, device and configuration management, NSO maintenance, NSO options and integrations, and basic NSO troubleshooting.

Virtual Learning

This interactive training can be taken from any location, your office or home and is delivered by a trainer. This training does not have any delegates in the class with the instructor, since all delegates are virtually connected. Virtual delegates do not travel to this course, Global Knowledge will send you all the information needed before the start of the course and you can test the logins.

## Target Audience:

The primary audience for this course is system installers, system integrators, system administrators, network administrators, and solutions designers.

## Objectives:

- Upon completion of this course, you should be able to:
- Explain the benefits and uses of Cisco Network Services Orchestrator (NSO)
- Install NSO and describe how NSO uses NETCONF and the Device Manager component
- Describe how YANG is used with NSO, create and deploy a service, and explain NSO FASTMAP
- Design and manage services with YANG models
- Perform NSO configuration and basic troubleshooting, and describe the following NSO features: integration options, alarms and reporting, scalability and performance options, and available function packs

## Prerequisites:

- Programming for Network Engineers (PRNE) (on demand)
- Designing and Implementing Cisco Network Programmability (NPDESI), especially modules 1 and 3
- Or the following knowledge and skills:
- Basic knowledge of the Cisco Command-Line Interface (CLI) or the CLI of UNIX-like operating systems
- Basic knowledge of YANG data modeling
- Basic knowledge of Python programming
- Basic management of network components (routers, switches, etc.)

## Content:

Module 1: Introduction to Cisco NSO:

- Meeting Challenges with Orchestration
- Challenges of Network Management
- Challenges of Network Orchestration
- NSO Features and Benefits that Meet Challenges
- Standardized Approach

What Is NSO?

- Logical Architecture
- Components

What Does NSO Do?

- Orchestration Use Cases

How Does NSO Work?

- Introduction to NETCONF and YANG
- Packages
- Mapping Logic
- Network Element Drivers

Resources and Training

- Resources
- Training

Module 2: Get Started with Cisco NSO

Installing Cisco NSO

- Setup Overview
- Cisco NSO Local Installation
- Installing NEDs
- Using NetSim

NETCONF Overview

- Challenges of Network Management
- Introduction to NETCONF
- NETCONF Operation

Device Manager

- Device Manager Overview
- Device Configuration Management
- Device Connection Management
- Templates and Groups
- Other Device Management Tools

Module 3: Service Manager Essentials

YANG Overview

- Introduction to YANG
- Other Representations of YANG
- Data Types
- XPath Overview
- Basic YANG Statements
- Can You Spot the Error?

Using Services

- Package Architecture
- Creating a Service Package
- Sample Service Configuration
- Service Template
- YANG Service Model
- Deploying a Service

Model-to-Model Mapping

- Mapping Introduction
- Mapping Logic
- FASTMAP
- Template Processing

Module 4: Service Design and Cisco NSO Programmability

Service Design

- Service Design Overview
- Top-Down Approach
- Bottom-Up Approach
- Device Configuration
- Service Model

Service Management

- Service Management Tasks
- Service Lifecycle Management Guidelines

NSO Programmability Introduction

- NSO Programmability Overview
- Python Service Skeleton
- Creating a Service YANG Model
- Creating a Service Template
- Template Processing with Python

Module 5: Cisco NSO Flexibility

System Configuration and Troubleshooting

- System Configuration
- System Troubleshooting

Integration

- Integration Options
- NETCONF Server
- Web Integration

Scalability and Performance

- High Availability
- High-Availability Cluster Communications
- Clustering
- Layered Service Architecture
- Addressing Performance Limitations

Components and Function Packs

- Function Packs
- NFV Orchestration
- Reactive FastMap

Lab outline:

Lab 1: Installing Cisco NSO

Lab 2: Using Device Manager

Lab 3: Creating a Loopback Template Service

Lab 4: Creating a VLAN Template Service

Lab 5: Creating an L3VPN Template Service

Lab 6: Creating an SVI Python Template Service

Lab 7: Using NSO REST API with Postman

- SNMP Agent

Alarm Management and Reporting

- Alarm Management
- Reporting

## Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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