Learning Services

Designing and Implementing Cisco Network Programmability (NPDESI) v1.0

Overview

The Designing and Implementing Cisco Network Programmability (NPDESI) version 1.0 Cisco Training on Demand course addresses the evolving role of network engineers toward more programmability, automation, and orchestration, enabling you to leverage the powerful level of abstraction provided by controller-based architectures to create real added value.

You learn how to minimize the number of manual interactions with the network, and increase the use of scripts and automation tools to reduce operational inefficiencies. The course teaches you how to review network programmability fundamentals, including Linux and Python, common automation protocols such as Network Configuration Protocol (NETCONF) and representational state transfer (REST), and explains how they relate to YANG data models.

The course also enables you to understand software-defined networking (SDN) controllers, including Cisco® Application Policy Infrastructure Controller (APIC™), APIC Enterprise Module (APIC-EM), and Open SDN Controller (OSC), as well as how to use device-level APIs such as Cisco NX-OS, Cisco IOS® XE, Cisco IOS XR, and ASA OS. Finally, it introduces you to DevOps and Agile software development methodologies, and helps you get started using automation tools such as Ansible, Chef, and Puppet.

Duration

The NPDESI v1.0 Training on Demand course is a self-paced course based on the 5-day instructor-led training version. It consists of 26 sections of consumable segments via instructor video and text totaling more than 9 hours of instruction along with interactive activities, 43 hands-on lab exercises, content review questions, and challenge questions.
Target Audience
This course is designed for entry-level to experienced network administrators; network field and systems engineers; designers, operations and automation engineers, and programmers; and those preparing for the 300-550 NPDESI exam.

Objective
After completing this course, you should be able to:

- Understand the basics of network programmability
- Use basic Linux commands and configure networking
- Write and troubleshoot Python scripts
- Understand and use the REST and NETCONF programmability interfaces of various Cisco controllers and devices
- Consume and comprehend YANG data models
- Know DevOps and Agile software development methodologies
- Use practical application of the Ansible automation tool

Course Prerequisites
The knowledge and skills necessary before attending this course is:

- Cisco CCNP® or equivalent experience
- Complete the Programming for Network Engineers (PRNE) ELT or equivalent Python programming experience

Course Outline
- Section 1: Introduction to Network Programmability
- Section 2: Linux Primer for Network Engineers
- Section 3: Linux Networking
- Section 4: Python Foundations for Network Engineers – Part 1
- Section 5: Python Foundations for Network Engineers – Part 2
- Section 6: Writing and Troubleshooting Python Scripts
- Section 7: Python Libraries
- Section 8: Introduction to Network APIs and Protocols
- Section 9: Cisco ASA REST API
- Section 10: NX-OS Programmability
- Section 11: Cisco IOS XE APIs
- Section 12: Cisco IOS XR APIs
- Section 13: Securing the Management Plane
- Section 14: YANG Data Modeling
- Section 15: YANG Tools
- Section 16: Describing the Cisco APIC-EM Advanced Applications
- Section 17: Exploring Cisco APIC-EM REST APIs
- Section 18: Using Cisco APIC-EM Developer Resources for Postman and Python
- Section 19: Introducing the OpenDaylight SDN Controller
- Section 20: Working with the OpenDaylight Code
- Section 21: Describing Network Programming Tools and Techniques
- Section 22: Introduction to DevOps
- Section 23: Version Control
- Section 24: Automated Testing
- Section 25: Continuous Integration
- Section 26: Configuration Management and Automation Tools

Labs Outline

This course contains 43 hands-on lab exercises.

Representative topology for all labs in the course:

![Control and Data Plane topology](image)

The labs included in this course are:

- Discovery Lab 2.8: Using the Linux Command Line
- Discovery Lab 3.5: Linux Networking
- Discovery Lab 4.8: Python Foundations – Part 1
- Discovery Lab 5.8: Python Foundations – Part 2
- Discovery Lab 6.7: Writing and Troubleshooting Python Scripts
- Discovery Lab 7.6: Custom Python Libraries
- Discovery Lab 8.5: Working with JSON Objects in Python
- Discovery Lab 8.7: Using XML in Python
- Discovery Lab 8.12: NETCONF Capabilities Exchange
- Discovery Lab 10.4: NX-API Discovery
- Graded Lab 10.9: Consume NX-API with Python
- Graded Lab 10.9: Consuming NETCONF on Nexus
- Discovery Lab 10.10: Using Python on the Nexus Switch
- Graded Lab 11.5: Interacting with the Cisco IOS XE RESTCONF API
Cisco Capital

Financing to Help You Achieve Your Objectives

Cisco Capital can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there’s just one predictable payment. Cisco Capital is available in more than 100 countries. Learn more.