

Python for Networks: Netmiko, NETCONF & YANG

Learn to automate Cisco network devices with Python, using Netmiko, RESTCONF, NETCONF, YANG and ACI APIs.

5 Days

40 HOURS

23

TOPICS

27

HANDS-ON LABS

COURSE OVERVIEW

The Python Programming for Network Engineering course is a comprehensive program designed to equip network engineers with the skills necessary to leverage Python for automating and enhancing network operations. By integrating Python programming into network tasks, learners can streamline processes, rapidly configure devices, and effectively manage data structures. Starting with the basics in Module 1, students will gain a solid foundation in Python syntax and commands. As the course progresses, they delve into more complex topics such as Python data structures in Module 2, utilizing Python Operators in Module 3, and file manipulation in Module 4. Modules 5 and 6 focus on controlling program flow and defining functions. Python Libraries, Packages, and Modules in Module 7 introduce indispensable tools for network tasks, while understanding and using Integrated Development Environments in Module 8 enhance coding efficiency. Module 9 tackles code analysis and error handling. The course transitions to practical application with a GNS3 Lab Setup in Module 10, followed by hands-on device configuration using CLI and remote access in Modules 11 and 12. Module 13 explores the Netmiko Library, and Module 14 covers data structuring languages like JSON, XML, YML, which are essential for modern network configurations. Learners will also become familiar with Cisco-supported APIs and automation protocols in Module 15, RESTCONF and NETCONF APIs in Modules 16 and 17, and Cisco Nexus NX-OS APIs in Module 18. Module 19 dives into the YANG data model, and finally, Module 20 provides extensive labs to practice and reinforce the acquired skills. This course is ideal for network professionals looking to harness the power of Python for network automation, ensuring they stay updated with the evolving landscape of network technology.

Who Should Attend

The “Python Programming for Network Engineering” course is designed for IT professionals seeking to integrate Python into network operations and configurations.

Network Engineers

Network Architects

System Administrators

DevOps Engineers

Security Engineers

Technical Support Specialists

Software Developers with a focus on network automation

IT Professionals looking to upskill in network automation

Students pursuing a career in network engineering or IT infrastructure

Professionals working on Cisco network environments

Anyone interested in understanding network device automation using Python

LEARNING OBJECTIVES

What You Will Learn:

- Write and test several functional Python scripts
- Write, edit, modify, and expand complex Python scripts to utilise APIs and data models
- Use the following APIs to automate configuration and management of Cisco networking devices: Paramiko, REST, XML, JSON, NETCONF, RESTCONF
- Use the YANG and MIT data models to read and manage objects to automate configuration and management of Cisco networking devices
- Use the following DevOps / learning tools to enable efficient use of APIs and data models and effectively create Python scripts: Postman, IDEs for both Windows and Linux, Notepad++, Sublime, PyCharm, Microsoft Visual Studio, Anaconda, Linux VI Editor, Lint tools for XML and JSON, Visore for Cisco Data Center, API Inspector for Cisco ACI, YANG Validator
- Automate configuration of multiple Cisco devices

23 Topics

TOPICS

27 Labs

- Introduction
- Fundamental Python programming
- Python data structure
- Using Python to read from and write to a file
- Python loops and conditional code
- GitHub
- Programming Python Functions
- Python Libraries, Packages, and Modules
- Integrated Development Environments
- Python code analysis and error handling
- Cisco-supported APIs and automation protocols
- Cisco IOS XE RESTCONF API
- Cisco IOS XE NETCONF API
- Cisco ASA REST API
- Cisco Nexus NX-OS APIs
- YANG data model
- Cisco Application Centric Infrastructure
- Cisco ACI whitelists
- Extracting XML and JSON from the Cisco ACI
- Modifying the ACI policy with Postman and Python
- The Cisco ACI Visore tool
- Cisco UCS topology
- Configuring UCS with Python

Practise What You Learn

MODULE	ACTIVITY
	■ Practice the effects of fundamental Python commands ■ Program Python data structure ■ Create Python scripts to interact with files ■ Write scripts to demonstrate Python loops and conditional code ■ Create a Python script ■ Share files using Git and GitHub ■ Write Python Functions ■ Write Python code of Modules and Packages ■ Implement Python code in IDEs ■ Debug and test Python code ■ Create, execute, and validate a Python script with an IDE ■ Explore and validate automation protocols ■ Perform a configuration change on an IOS XE device with the RESTCONF API ■ Perform a configuration change on an IOS XE device with the NETCONF API ■ Perform a configuration change on an ASA device with the REST API ■ Perform a configuration change on a Nexus NX-OS device using APIs ■ Troubleshoot existing Python scripts with an IDE ■ Analyze YANG files with the online YANG validator tool ■ Perform an ACI fabric discovery ■ Manually configure a Cisco ACI whitelist ■ Extract XML and JSON from the Cisco ACI ■ Utilize the API inspector and Postman to create Python scripts ■ Use the Cisco ACI Visore tool ■ Create a Python script to modify an ACI fabric ■ Manually configure Cisco UCS ■ Configure UCS with Python ■ Create a Python script to modify a UCS configuration

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

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Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

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