Network Automation with Python and Ansible

What you'll learn in this course

This course is designed to equip you with fundamental skills in Python Programming. Course is designed to provide network engineers with the skills and knowledge they need to be able to program network devices such as Routers and Switches. This course covers the basics of programmatic control of routers and switches. Through a combination of lectures and experience in simulated network environment, you will learn to use Python basics to create useful and practical scripts with Netmiko to retrieve data and configure Network devices. The course provides hands-on training for students to learn the concepts and practice programming on simulated learning environments.

Course Duration

- Instructor-led Training: 05 Days of in-class learning and lab experience

How you'll benefit

This course will help you:

- Explain the need for network engineers to learn how to program
- Explain how programming relates to the journey into network automation and programmability
- Create useful and practical scripts to retrieve data and configure network devices
- Gain hands-on experience with Python programming
- Prepare to accelerate network automation in your organization

Who should enroll

This course is intended for:

- Network Administrators
- Network Engineers with little or no programming or Python experience
- Network Managers
- System Engineers
- Network Operators
- Automation Engineers

Prerequisites

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

- Basic network management knowledge
- CCNA or equivalent knowledge
- Knowledge of working with text editors

Course Details

Outline

1. Introducing Programmability and Python Introduction
   a. What is Network Automation ?
   b. Do we really need Network Automation ?
   c. Continued Importance of the CLI
   d. What is Python ?
   e. Python usage area
   f. Visual Studio IDE

2. Python Installation and Scripting
   a. Python Interactive Shell
   b. Python3 and Visual Studio for Windows
   c. Python3 and Visual Studio for Linux
   d. Python3 and Visual Studio for MAC

3. Python Functions – Print and Gathering User Input
   a. Print Function
   b. Print Function Usage
   c. Obtaining User Input

4. Exploring Python Modules and Packages
   a. Introduction
   b. Python Standard Library Modules
   c. Reusable Code with Modules and Packages
   d. Network Libraries
   e. Import External Libraries
   f. Netmiko
   g. Automate Networks with Netmiko

5. Python Data Types
   a. Introduction
   b. Strings Data Type
   c. Integer Data Type
   d. Float Data Type
   e. Boolean Data Type
   f. type() function
   g. List Analysis
   h. Python Dictionary
   i. Python Tuples
   j. Nested Data Types

6. Manipulating Strings
   a. Introduction
   b. String Manipulation
   c. String Splitting
   d. Modifying String
   e. String Concatenation
   f. Whitespace Stripping
   g. Escape Characters
   h. Regular Expressions
   i. String Methods

7. Python Flow Control
   a. Introduction
   b. Python Operators
   c. Conditional Statements
   d. Loops
   e. Break and Continue statement
   f. Range Function
   g. Loops with Lists, Dicts and Ranges
   h. Nested Loops

8. Python File Handling and Data Storage Options
   a. Introduction
   b. Reading Data from a simple text file
   c. Writing Data to a text file
   d. Working with CSV files
   e. Read Data in CSV format
   f. Working with XML Formats
   g. Working with JSON Format

9. Python Functions and Classes
    a. Introduction
    b. Practical Reuse of Code
    c. Functions
    d. Create and Use Functions
    e. Code Commenting
    f. Namespaces and Scopes
    g. Classes and Methods
    h. Main Construct

10. Introducing Ansible for Network Automation
    a. Introduction
    b. Configuration Management Tool
    c. Introduction to Ansible
    d. Introducing YAML Language

11. Ansible Architecture and Features
    a. Ansible Concepts
    b. Ansible Architectures
    c. Ansible Features
    d. Install Ansible on Ubuntu
    e. Install Ansible on CentOS

12. Working with Ansible
    a. Ansible Inventory File
    b. Ansible Configuration File
    c. Ansible – Ad hoc Commands
    d. Ansible – Playbooks

Lab Outline:

1. Use the Python Interactive Shell
2. Creating Python program using IDE
3. Automate Network using Netmiko
4. Explore Foundational Python Data Types
5. Explore Complex Python Data Types
6. Use Standard String Operations
7. Use Basic Pattern Matching
8. Reformat MAC Address
9. Use if-else Construct
10. Use for loops
11. Use while loops
12. Read Data in CSV Format
13. Read, Store and Retrieve Data in XML Format
14. Read, Store and Retrieve Data in JSON Format
15. Configure Network Devices with Ansible
16. Collect Network Data with Ansible
17. Run Show commands
18. Save logs to files
19. Ios Config Module
20. Send config commands