

# NETWORK AUTOMATION W/PYTHON AND PLAYBOOKS

Course Code: 100605

Learn how to automate your network using Python and Playbooks.

No two networks are the same! Regardless, your network can be automated with a powerful combination of Python and Ansible across all major (and most minor) network vendors. Lessons and labs focus on using both Python and Ansible to interact with and configure your network devices. At the conclusion of this course, you will return to work empowered with skills necessary to automate network management! This class is a combination of live demonstrations and hands-on labs with virtual network devices and endpoints as targets for your configuration.

## What You'll Learn

- Version controlling code with Git
- Open SSH sessions and pass commands to remote servers
- Remotely open CLI to network devices
- Move files via SFTP
- Overview of Ansible modules
- Ansible collections for network automation
- Custom Ansible modules with Python
- Best practices for automating the management and configuration of network devices

## Who Needs to Attend

- Network Administrators
- Playbook devs / architects
- Python devs
- Administrators interested in Automation
- Individuals interested in devops, specifically for networking

## Prerequisites

- Recommended Prerequisite: Python Basics (5 days)
- Coding experience in another language serves as an adequate prerequisite

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VIRTUAL CLASSROOM LIVE

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5 Day

## Virtual Classroom Live Outline

### Day 01

#### Python Basics Review

- Overview of Python and Ansible
- Python whitespace rules & best practices
- Conditional expressions
- Relational and Boolean operators
- Lists, Tuples, Dictionaries
- Indexing and slicing
- Built-in functions
- Writing custom functions
- Getting at methods
- Iterating with Loops (for and while)
- Working with files
- Software Control Management (SCM) (Git, Github, Bitbucket, Cloudshare, etc.)
- Getting at RESTful interfaces with Python
- Working with JSON
- Python, Ansible and Paramiko
- Using Paramiko to SSH with keys and passwords

### Day 02

#### Python and Network Automation

- RESTful API review
- API keys
- Paramiko Review
- Using Paramiko to SFTP with keys and passwords
- Introduction to Netmiko (automating routers and switches)

- Using Netmiko to send commands to / from network devices
- Working with YAML
- Converting JSON to YAML with Python

## **Day 03**

### **Basic Ansible Review**

- Ansible keywords
- YAML and JSON for data exchange
- Ansible and YAML
- Ansible Playbook components
- Tying together Python and Ansible – Using Python within Ansible
- Ansible Network Modules
- What is new in Ansible (most current updates / release notes)
- Network Agnostic modules
- Writing network playbooks
- Reviewing the construction of network playbooks
- Writing Ansible playbooks that respond to network failures

## **Day 04**

### **Blending Python and Ansible Skillsets**

- Review how to use Python within Ansible
- Calling Python scripts with Ansible
- Jinja2 Templating Engine for Python (and Ansible)
- Using Templates in Ansible playbooks
- Jinja2 filters, looping, and other useful tricks for automating with Ansible
- Playbook tagging for selective runs
- When to use Python and when to use Ansible
- “Big Picture” options for using Python & Ansible within your Network
- Ansible Roles
- Extending Ansible to support Palo Alto (Optional - Case Study)
- Extending Ansible to support Juniper vendor modules (Optional - Case Study)
- Extending Ansible to support NAPALM (Optional - Case Study)

## **Day 05**

### **Customizing Ansible with Python**

- Review – Running Scripts with Ansible
- Prompting for Ansible user input
- Ansible Galaxy & Getting at Roles
- Writing a custom Ansible Module with Python
- Ansible “Engine” vs Ansible “Tower” – marketing hype, capabilities, costs, etc.
- Case Study: Automate your Enterprise Network
- When to use Python and when to use Ansible
- Writing your own Ansible modules in Python

- “Big Picture” options for using Python & Ansible within your Network
- Overview - NETCONF / YANG and what they mean for Python and Ansible
- Molecule - Testing your roles

## Virtual Classroom Live Labs

1. Using vim
2. Using & Installing Python
3. Making a Github account
4. Data within mixed lists
5. Understanding More about Lists
6. Python Dictionaries
7. Getting dir(obj) help() and pydoc
8. Copying Files and Folders
9. Moving and Renaming Files and Folders
10. IPv4 Testing with if
11. Paramiko - SSH with RSA Keys
12. Paramiko - SFTP with UN and PW
13. Space APIs the Final Frontier
14. More APIs - Final Frontier is Vast
15. Interaction with APIs - NASA 01
16. Interaction with APIs - NASA 02
17. Install GNS3
18. Setup for GNS networking
19. Configure the Switches
20. Running Netmiko
21. Running your first Playbook
22. Debug Module
23. Playbook Prompts
24. Register and when
25. EOS Get Config and Archive
26. Agnostic Network Modules
27. Network Playbook Error Handling
28. Network Playbook Precheck
29. Network Playbooks with Roles and Rollbacks
30. Securing Playbooks with Vault
31. Network Playbooks, Set Fact, and Fail
32. Debug, Loops, and YAML Lists
33. Running a script with Ansible
34. Jinja Filters
35. Ansible, Python Methods, and Jinja Filters
36. Ansible and APIs
37. Python and Ansible
38. Writing an Ansible Module with Python
39. AWX Tower

## 40. Molecule – Testing Roles



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PRIVATE GROUP TRAINING

5 Day

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