



## Automating Palo Alto with Terraform

- 3 Days
- Lecture and Hands-on Labs

### Course Overview

Get hands-on and use Terraform to automate the PAN-OS operating system for Palo Alto Networks NGFWs and Panorama products. Students will learn to manage various aspects of a firewall's or a Panorama's config, such as data interfaces and security policies. Optional lecture may also cover Palo Alto Networks Terraform providers for Prisma Cloud, Bridgecrew Security Platform, or Palo Alto Networks Cloud Next-Gen Firewalls for AWS. All lessons focus on best practice techniques, including interacting with git, GitHub or GitLab, and writing prompts for AI LLM tools to generate relevant solutions.

### Who Should Attend

- Palo Alto Administrators
- Security Engineers
- DevOps Engineers
- System and Cloud Administrators
- Network Engineers and Developers
- Terraform Developers
- Go Programmers

### What You'll Learn



- Automating the PAN-OS and Panorama APIs with Python and Ansible
- AI LLM prompt engineering for generating Ansible solutions
- Ansible collections for Palo Alto network appliances
- YAML formatting
- Playbook construction and order of execution
- Credential Management and Encryption with Ansible Vault and other credential management best practices
- Python and other client side software for exploring PAN-OS and Panorama APIs
- Exploring the PAN-OS
- Version controlling code with Git
- CI / CD Pipeline Scenarios common across Industry (GitHub Actions, GitLab, AWX Tower, and more)

### Outline

#### AI LLM Toolkit

-  Lecture + Lab: Large Language Model toolkit for AI Solution Assistance

#### Introduction to Terraform

-  Lecture: Terraform Course Map
-  Lecture: Introduction to Terraform






## Software Control Management

-  Lecture + Lab: SCM Option #1 - GitHub
-  Lecture + Lab: SCM Option #2 - GitLab








## Up and Running

-  Lecture + Lab: Terraform Install
-  Lecture: Special Considerations for Palo Alto Networks










## Terraform Modules

-  Lecture: Terraform HCL Syntax
-  Lecture + Lab: Up and Running with Terraform
-  Lecture + Lab: Terraform Variables
-  Lecture + Lab: Output Values
-  Lecture: Avoid the :latest Tag

## Palo Alto Provider

-  Lecture: Terraform Providers
-  Lecture + Lab: Palo Alto Network on the Terraform Registry
-  Lecture: Terraform and PAN-OS Interaction
-  Lecture + Lab: Installing the PaloAltoNetwork panos Provider
-  Lecture + Lab: Managing State with PaloAltoNetwork panos Provider
-  Lecture: Terraform Data Sources
-  Lecture + Lab: Palo Alto Network panos Data Sources

## Beyond Basics

-  Lecture: Credential Management Options for Terraform and Palo Alto Interactions
-  Lecture + Lab: Terraform CLI Workspaces
-  Lecture + Lab: Handling Errors on from PaloAltoNetwork Providers
-  Lecture: Resources - replace vs taint
-  Lecture + Lab: Dynamic Operations with Functions
-  Lecture: Short-cutting Solutions for Palo Alto with Terraform Modules
-  Lecture + Lab: Creating a Terraform Module
-  Lecture + Lab: Dynamic Provisioning with tfvars Files
-  Lecture + Lab: Data Sources and HTTP Provider


## Loops

-  Lecture: for\_each
-  Lecture + Lab: Looping Constructs - for\_each

## Provisioning

-  Lecture + Lab: Creating Delays
-  Lecture + Lab: Terraform - templatefile Function

## Dynamic Blocks

-  Lecture + Lab: Dynamic Blocks

## Generative AI LLM Toolkits

- 📖 Lecture + Lab: Creating prompts for AI LLM tools to Generate Palo Alto Terraform Code
- 📖 Lecture + Lab: Testing Terraform Solutions Generated by AI

## Expanding on Palo Alto Network Providers (OPTIONAL)

- 🗣️ Lecture: Palo Alto Providers - panos, prismacloud, bridgecrew, prismacloudcompute, prismacloud-waas, cloudngfwaws
- 🗣️ Lecture: Palo Alto Networks Cloud Next-Gen Firewalls for AWS
- 📖 Lecture + Lab: Terraform and Palo Alto Networks Cloud Next-Gen Firewalls for AWS
- 🗣️ Lecture: Terraform and Palo Alto Networks Prisma Cloud
- 🗣️ Lecture: Terraform and Palo Alto Networks Bridgecrew Security Platform

## Terraform Cloud (OPTIONAL)

- 📖 Lecture + Lab: Terraform Cloud and Terraform Enterprise
- 📖 Lecture + Lab: Triggering Cloud Builds via Git Commits

## Industry Scenarios (OPTIONAL)

- 🗣️ Lecture: Common Workflows and Pipelines for Automating Security Platforms
- 📖 Lecture + Lab: GitHub Actions - Terraform

## Terraform Review

- 🗣️ Lecture: HashiCorp Terraform Study Guide

## Prerequisites

- Coding experience in another language serves as an adequate prerequisite

## Next Courses

- Automating Palo Alto with Python and Ansible (5 days)
- Consulting with an Automation Expert (varies per request)
- Go (Programming) Essentials (4 days)
- Git and GitHub (2 days)
- Git and GitLab CI/CD (2 days)