

CI/CD with Ansible and Terraform

Learn to automate configuration management, provision cloud infrastructure, and build CI/CD pipelines with Git, Ansible, Terraform and Jenkins.

8 Days

64 HOURS

19

MODULES

66

TOPICS

50

HANDS-ON LABS

COURSE OVERVIEW

The “CI/CD with Ansible and Terraform” course is designed to provide learners with a comprehensive understanding of continuous integration and continuous delivery/deployment (CI/CD) practices using Ansible and Terraform, two powerful tools in the DevOps toolkit. Starting with an introduction to Git for version control, the course progresses through the essentials of Ansible for Configuration Management and application deployment. It covers Ansible’s architecture, Modules, Playbooks, Variables, and its integration with AWX Tower for managing complex workflows. The course then dives into Terraform, instructing on how to build, change, and version infrastructure efficiently. It explores the nuances of setting up and managing Cloud infrastructure, working with configurations, and using Terraform’s provisioners. The latter part of the course introduces Jenkins, a key CI/CD automation server, and integrates it with Ansible and Terraform to achieve end-to-end automation. By mastering CI/CD with Ansible and CI/CD with Terraform, learners can streamline software development processes, ensure consistent environments, and greatly reduce manual efforts, leading to more reliable and rapid releases. This course is ideal for those looking to become adept at using these tools to enhance their DevOps capabilities.

Who Should Attend

Target job roles and audience for the CI/CD with Ansible and Terraform course:

DevOps Engineers

Infrastructure Automation Engineers

Software Developers interested in DevOps practices

System Administrators transitioning to DevOps roles

Cloud Engineers and Architects

IT Professionals working on infrastructure management and deployment

Build and Release Engineers

Technical Project Managers overseeing DevOps teams

Operations Support staff involved in CI/CD processes

Security Professionals integrating infrastructure as code into security practices

Quality Assurance Engineers involved in deployment and automation

IT Students and Graduates aspiring to enter DevOps or Cloud Computing careers

LEARNING OBJECTIVES

- Use Git for version control and branching workflows
- Configure Ansible and run modules with ad-hoc commands
- Write Ansible playbooks using variables, loops and handlers
- Manage inventory and jobs with AWX Tower
- Provision Azure infrastructure with Terraform providers and state
- Apply Terraform variables, meta-arguments and dynamic blocks
- Implement Terraform provisioners, modules and workspaces
- Configure Jenkins jobs integrated with Ansible and Terraform

COURSE SYLLABUS

19 Modules, 66 Topics

01

6 Labs

Git

TOPICS

- Introduction to Version Control System History of GIT
- Git Basics
- States in Git Installing Git
- Configuration of Git
- Working with Repositories
- Basic Git Commands
- Working with Remotes
- Tagging
- Git Branching

01

Introduction to Ansible

TOPICS

- Evolution of Infrastructure
- Overview of Infrastructure as a Code What is Configuration Management Ansible Overview
- Case Study

02**Lab**

Ansible Architecture and Installation

TOPICS

- Ansible Architecture and It's Working Ansible in DevOps
- Installation and Configuration Working with Command Line Tools

03**Lab**

Ansible Modules

TOPICS

- Overview of Modules Types of Modules Core Modules
- Extras Modules Return Values
- Ad-Hoc Commands Case Study

04**Lab**

The Playbook Grammar

TOPICS

- Introduction to YAML Playbook YAML Definition Playbook Terms
- Playbook Tasks
- Writing Ansible Playbooks

05**4 Labs**

Variables, Conditions, Loops, Handlers and Jinja2 Templates

TOPICS

Variables · Loops · Notify and Handlers · Jinja2 Templates

06**2 Labs**

AWX Tower

TOPICS

- Installing AWX Tower Features of Ansible Tower Managing Jobs
- Manage and Track Inventory Remote Command Execution
- Case Study

01**3 Labs**

Getting Started & Setting Up Labs

TOPICS

- Introduction to Infrastructure as Code and Terraform
- Comparison between Terraform and Ansible
- Introduction to Azure CLI
- Understanding Terraform Providers
- Authenticate Azure with Terraform
- **Basic Terraform commands:** init, plan, apply

02**5 Labs**

Building Cloud Infrastructure with Terraform

TOPICS

- Understanding Terraform State file
- Understanding Working of State file – Desired State & Current State
- Terraform Provider Versioning

03**14 Labs**

Read, Generate, Modify Configurations

TOPICS

- Understanding Attributes and Output Values in Terraform
- Understanding Terraform Variables and Data Types – (String, Number, Boolean, List, Map)
- Understanding Meta-Arguments – (for_each, count, depends_on)
- Understanding conditional expression and locals
- Understanding Expressions – for & Splat expression
- Understanding Data Sources & Dynamic Blocks
- Terraform Commands – validate, fmt

04**Lab**

Terraform Provisioners

TOPICS

Understanding provisioners in Terraform · Understanding Connection Block · Types of provisioners

05**3 Labs**

Terraform Modules & Workspaces

TOPICS

- Applying the DRY (Don't Repeat Yourself) principle
- Understanding Usage of Terraform Modules
- Standard Structure of Terraform Modules
- Understanding and implementing Terraform workspaces

01**Lab**

Introduction to Jenkins

TOPICS

Introduction to Jenkins · Jenkins Installation · Introduction to Jenkins UI · Create First Job

02**2 Labs**

Add SSH Node Credentials in Jenkins

TOPICS

- Install SSH Plugin in Jenkins Add Credentials of Node
- Integrate Node SSH Server with Jenkins

03**Lab**

Build Job on Remote Machine

TOPICS

- Deploy Web Server Automatically through Jenkins

04**2 Labs**

Jenkins Security

TOPICS

- Enable/Disable Login in Jenkins Allow Users to Sign up
- Create Users Manually in the Jenkins DB Create and Manage Roles for Jenkins Users

05**Lab**

Jenkins Email Integration

TOPICS

- Install a Mail Plugin Integration Jenkins and G-mail
- Add notifications to your jobs

06**Lab**

Jenkins Ansible Integration

TOPICS

- Store Playbooks, Inventory and Configuration Files on GitHub Automatically Pull Code from GitHub
- then Run on Ansible Server

07**Lab**

CICD with Jenkins and Terraform

TOPICS

- Store Terraform Files, Playbooks, Inventory and Configuration Files on GitHub
- Automatically Deploy VMs With the Help of Terraform and Once Machine is Deployed then Run
- Ansible to Configure Those VMs

Practise What You Learn

#	MODULE	ACTIVITY
01	Git	■ Installation of GIT on system ■ Create GIT repository ■ Create commits and switch in between commits ■ Create repository on GITHUB and then push local repository on GITHUB repository ■ Give tag to commits ■ Create branch and then switch and merge branches
02	Ansible Architecture and Installation	Installation and configuration of Ansible on machine
03	Ansible Modules	Run Ansible modules with Ansible Ad-Hoc Commands
04	The Playbook Grammar	Create playbook for running multiple task on managed nodes
05	Variables, Conditions, Loops, Handlers and Jinja2 Templates	■ Run playbook by using variables ■ Run playbook by using loop ■ Run playbook by using notify and handlers ■ Create jinja2 templates file and use in playbook
06	AWX Tower	■ Installation and configuration of AWX Tower on system ■ Run playbooks on AWX Tower
01	Getting Started & Setting Up Labs	■ Installation of Terraform on Windows ■ Setting Up Terraform on Windows and Azure Authentication ■ Defining Provider & Using Basic Terraform commands
02	Building Cloud Infrastructure with Terraform	■ Creating Resource Groups in Azure ■ Provisioning Virtual Networks, Subnets, Public Ips, and Network Interfaces ■ Deploying Windows and Linux VMs ■ Configuring Azure Storage, Security Groups, and Load Balancers ■ Methods to define Terraform Provider Versions

#	MODULE	ACTIVITY
03	Read, Generate, Modify Configurations	■ Handling Terraform attributes and output values ■ Referencing attributes across resources ■ Methods to Define Variables & Variable Arguments ■ Fetching Data from List & Map in Variables ■ Using Meta-Arguments ■ Using Conditional expression and Locals ■ Using for and Splat expression ■ Using Data Sources ■ Using Dynamic Blocks ■ Exploring debugging techniques in Terraform ■ Using terraform validate and terraform fmt ■ Replacing Resource in terraform manually – taint and replace ■ Using Terraform Graph utility ■ Saving Terraform Plan to a file and apply from plan file
04	Terraform Provisioners	Implementing remote-exec and local-exec provisioners
05	Terraform Modules & Workspaces	■ Creating and Using local Modules ■ Utilizing Modules from Terraform Registry ■ Working with Terraform Workspaces
01	Introduction to Jenkins	Installation of Jenkins
02	Add SSH Node Credentials in Jenkins	■ Install SSH Plugin in Jenkins and add SSH server credentials for authentication ■ Integration of SSH server with Jenkins to run projects
03	Build Job on Remote Machine	Deploy Web Server by using Jenkins and access Web Server from browser
04	Jenkins Security	■ Enable/Disable Login for users ■ Create users and roles and give privileges to users as per roles
05	Jenkins Email Integration	Configure and enable Gmail notification for Jenkins Projects
06	Jenkins Ansible Integration	Integration of Jenkins with Ansible and pull playbooks from GITHUB and run on Ansible server
07	CICD with Jenkins and Terraform	Intergrating Jenkins with Ansible and Terraform

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.

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