



Terraform - Infrastructure as Code

- 3 Days
- Lecture and Hands-on Labs
- Includes all objectives found on HashiCorp's Terraform Associate Certification

Course Overview

As enterprises seek to deploy and maintain increasingly complex cloud infrastructure, there is a necessity to use “Infrastructure as Code” (IaC) tools, like Terraform. An open-source, state management tool developed by HashiCorp, Terraform allows developers to use a common coding interface to work through their various clouds safely and efficiently. Attendees will leave being able to write and understand Terraform code (HCL), have a clear understanding of Terraform's various components and supporting tools, as well as when to reach for Terraform over another IaC tool, such as Ansible.

Review this course online at <https://www.alta3.com/courses/terraform>

Who Should Attend

- DevOps Engineers
- Software Developers
- Technical Managers and Leads
- System and Cloud Administrators
- Network Engineers and Developers

What You'll Learn



- Writing Terraform HCL code
- Deploying into common clouds such as AWS, Azure, Google Cloud, Docker, Oracle, Kubernetes, and VMWare
- Where Terraform fits in the Enterprise CI/CD model
- Differences between Terraform and Ansible
- Best practices
- Prepare for HashiCorp's Terraform Associate Certification
- AI LLM prompt engineering for Terraform snippets and jumpstarting solutions

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











Overview of Terraform

-  Lecture + Lab: Terraform Install
-  Lecture + Lab: gitignore for Terraform

Terraform Modules

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




Beyond Basics

-  Lecture + Lab: Terraform CLI Workspaces
-  Lecture + Lab: Terraform Expressions and Errors
-  Lecture + Lab: Resources - replace vs taint
-  Lecture + Lab: Dynamic Operations with Functions
-  Lecture + Lab: Creating a Terraform Module
-  Lecture + Lab: Moving State - terraform state mv
-  Lecture + Lab: Dynamic Provisioning with tfvars Files
-  Lecture + Lab: Data Sources and HTTP Provider
-  Lecture: Import pre-existing infrastructure
-  Lecture + Lab: CHALLENGE - AWS import

Loops

-  Lecture: for_each
-  Lecture + Lab: Looping Constructs - for_each


Provisioning

-  Lecture + Lab: local-exec Provisioner
-  Lecture + Lab: Creating Delays
-  Lecture + Lab: Terraform - templatefile Function






Terraform Cloud

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


Dynamic Blocks

-  Lecture + Lab: Dynamic Blocks

AWS

-  Lecture + Lab: Terraform and AWS
-  Lecture + Lab: Output Values and AWS
-  Lecture + Lab: AWS and looping with count vs for_each
-  Lecture + Lab: Correcting Resource Drift and AWS
-  Challenge: Terraform and AWS


Azure

-  Lecture + Lab: Terraform and Azure


Google Cloud Platform

-  Lecture + Lab: Terraform and Google Cloud Platform



Oracle

-  Lecture + Lab: Terraform and Oracle Cloud Infrastructure





Terraform and Enterprise

-  Lecture + Lab: Deploy a Go RESTful API microservice with Terraform
-  Lecture: Terraform vs. Ansible
-  Lecture + Lab: Terraform and Ansible


VMWare

-  Lecture: Terraform and VMWare
-  Lecture + Lab: Terraform and VMWare

Helpful DevOps Tools (OPTIONAL)

-  Lecture + Lab: Open Policy Agents and Terraform
-  Lecture + Lab: GitHub Actions - GitLeaks
-  Lecture + Lab: GitHub Actions - Terraform
-  Lecture: Terragrunt

Terraform Review

-  Lecture: HashiCorp Terraform Study Guide

Prerequisites

Although not required, students with some experience programming, or pre-existing knowledge of cloud architecture, will most appreciate the technical nature of this hands-on course.

Next Courses

- Jenkins Automation Server Essentials (2 days) (<https://alta3.com/courses/jenkins>)
- Ansible Essentials (5 days) (<https://alta3.com/courses/ansible-101>)
- Go Essentials (5 days) (<https://alta3.com/courses/golang>)
- Git and GitHub (2 days) (<https://alta3.com/courses/github>)
- Git and GitLab (2 days) (<https://alta3.com/courses/gitlab>)

Certification

- Terraform Essentials - Certification Project