

## Terraform

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### Course Summary

#### Description

Terraform is the leading tool for automating deployment and management of your infrastructure resources. Using Terraform as part of your continuous deployment pipeline enables repeatable results and eliminates human error when creating and managing infrastructure. As customers require new features, faster automation is the only way to keep up with demand. This class starts at the beginning and explains key concepts of infrastructure as code, Terraform principles, and industry best practices.

Attendees will leave with all the skills necessary to plan, test, create and manage infrastructure across multiple environments. They will understand how to create re-usable, version-controlled configuration files for repeatable results. Attendees will learn best practices for securely storing variables and secrets

#### Topics

- Introduction
- Programming Structure
- Resources
- Variables
- Terraform CLI
- State management
- Provisioners
- Modules and Workspaces
- Security
- Terraform Cloud
- Wrap-up

#### Audience

The audience for this class is Developers, Team Leads, DevOps, Architects, and any other Engineering personnel interested in an in-depth introduction to infrastructure management using Terraform. This class teaches best practices for creating, testing, and managing infrastructure.

#### Prerequisites

Attendees should have a basic understanding of Linux and command-line experience.

#### Duration

Two days

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### Course Outline

- I. Introduction*
  - A. Overview
  - B. Architecture
  - C. Why Terraform?
  - D. Comparison of tools
  - E. Core components
  - F. Fundamental concepts
- II. Programming Structure*
  - A. Providers
  - B. Resources
  - C. Variables
  - D. Data sources
  - E. Outputs
  - F. Cloud integration
- III. Resources*
  - A. Types and Arguments
  - B. Behavior
  - C. Dependencies
  - D. Local only resources
- IV. Variables*
  - A. Inputs
  - B. References
  - C. Outputs and Locals
  - D. Overrides
- V. Terraform CLI*
  - A. Features
  - B. Commands
  - C. Managing infrastructure
- VI. State management*
  - A. Local or Remote?
  - B. Remote storage options
  - C. S3
  - D. AzureRM
  - E. Google File Storage
  - F. Integrating with Git
  - G. Challenges with State file locking
  - H. Importing existing resources
- VII. Provisioners*
  - A. Types of Provisioners
  - B. Remote execute provisioners
  - C. Local execute provisioners
  - D. Storing provisioners in repository
- VIII. Modules and Workspaces*
  - A. Understanding DRY (Don't Repeat Yourself) principle
  - B. Variables and Modules
  - C. Terraform module registry
  - D. Terraform workspace
- IX. Security*
  - A. The right way to handle Access & Secret keys
  - B. Managing resources in multiple regions
  - C. Terraform and Identity Access Management (IAM)
- X. Terraform Cloud*
  - A. Overview
  - B. Creating infrastructure with Terraform Cloud
  - C. Overview of Sentinel
  - D. Implementing Remote backend operations in Terraform Cloud
- XI. Wrap-up*
  - A. Review
  - B. Q&A
  - C. Next steps