



Getting Started with Terraform for Google Cloud

Course description

In this course, you will learn the fundamental concepts and practical application of HashiCorp Terraform for managing infrastructure on Google Cloud Platform (GCP). You will gain a solid understanding of Infrastructure as Code (IaC) principles, how Terraform works, and how to effectively provision, manage, and scale Google Cloud resources. The course covers everything from initial setup and basic HCL syntax to state management, modularization, and integrating Terraform into a CI/CD pipeline. By the end of the course, you will be equipped to design, implement, and maintain robust and reproducible GCP infrastructure using Terraform.

- Course level: Fundamental
- Duration: 2 days

Activities

This course includes presentations, extensive hands-on labs, live demonstrations, and group exercises designed to reinforce practical skills.

Course objectives

In this course, you will learn to:

- Summarize the benefits of Infrastructure as Code (IaC) and Terraform's role in it.

- Install and configure Terraform for use with Google Cloud Platform.
- Authenticate Terraform to Google Cloud effectively and securely.
- Write basic and advanced Terraform configurations using HashiCorp Configuration Language (HCL).
- Provision, update, and destroy various Google Cloud resources using Terraform.
- Understand and manage Terraform state, including remote backends for collaborative work.
- Utilize Terraform variables, outputs, and local values for flexible configurations.
- Create and consume Terraform modules for reusability and organization.
- Implement best practices for Terraform configuration, security, and team collaboration.
- Discuss integrating Terraform into a Continuous Integration/Continuous Delivery (CI/CD) pipeline.

Intended audience

This course is intended for IT professionals, developers, and cloud engineers with some prior knowledge of Google Cloud:

- Cloud Engineers
- DevOps Engineers
- Site Reliability Engineers (SREs)
- Software Developers
- Infrastructure Architects
- IT Operations Specialists

Prerequisites

We recommend that attendees of this course have:

- Basic understanding of Google Cloud Platform (GCP) services (e.g., IAM, VPC, Compute Engine).
- Familiarity with command-line interfaces (CLI).
- Basic understanding of text editors and configuration files.

Course outline

Module 1: Introduction to Infrastructure as Code and Terraform

- The problem of manual infrastructure management

- Understanding Infrastructure as Code (IaC) principles
- Benefits of IaC (consistency, speed, auditability)
- Introduction to HashiCorp Terraform
- Terraform's role in the cloud ecosystem
- Terraform vs. other IaC tools (e.g., Cloud Deployment Manager, Pulumi, Ansible)
- Demo: A quick look at a simple Terraform configuration

Module 2: Setting up Terraform for Google Cloud

- Installing Terraform CLI
- Google Cloud Project setup and organization
- Authenticating Terraform to GCP
 - Google Cloud SDK (gcloud CLI)
 - Service Account keys (for automated environments)
 - User authentication (gcloud auth application-default login)
- Terraform providers overview
- Configuring the Google Cloud Provider in Terraform
- Hands-on Lab: Installing Terraform and Authenticating to GCP

Module 3: Terraform HCL Fundamentals

- Introduction to HashiCorp Configuration Language (HCL)
- Basic structure of a Terraform configuration file (.tf files)
- Defining resources: resource blocks
- Data sources: data blocks for querying existing resources
- Variables: variable blocks for input parameters
- Outputs: output blocks for exposing information
- Local values: locals for intermediate computations
- Expressions, functions, and conditional logic in HCL
- Hands-on Lab: Writing Your First Terraform Configuration to Create a GCP Project

Module 4: Managing Google Cloud Resources with Terraform

- Lifecycle of a Terraform configuration: init, plan, apply, destroy
- Provisioning Compute Engine instances, networks, and firewalls
- Managing Cloud Storage buckets and objects
- Deploying Cloud SQL instances
- Configuring IAM roles and service accounts

- Understanding resource dependencies and graph creation
- Hands-on Lab: Provisioning a Web Server Infrastructure on GCP with Terraform

Module 5: Terraform State Management and Best Practices

- Understanding the Terraform state file (terraform.tfstate)
- Importance of state in tracking infrastructure
- Local vs. Remote State -Using Google Cloud Storage as a remote backend
- State locking for collaborative environments
- terraform state commands: inspect, move, rm
- Handling sensitive data in Terraform (e.g., using tfvars and environment variables)
- Best practices for structuring Terraform projects
- Hands-on Lab: Configuring Remote State in Google Cloud Storage

Module 6: Advanced Terraform Concepts for GCP

- Terraform Modules: Creating reusable components
- Module inputs, outputs, and versions
- Using modules from the Terraform Registry
- Dynamic Blocks for creating repetitive configurations
- Provisioners (remote-exec, local-exec, file) and their limitations
- count and for_each for creating multiple similar resources
- terraform import for adopting existing resources
- terraform refresh and terraform taint
- Hands-on Lab: Building Reusable Infrastructure with Terraform Modules

Module 7: Collaboration and CI/CD with Terraform

- Team collaboration workflows with Terraform
- Pull requests and code review for infrastructure changes
- Integrating Terraform into CI/CD pipelines
- Automated terraform plan for previewing changes
- Automated terraform apply for deployment
- Using Terraform Cloud or Terraform Enterprise for advanced collaboration and management
- Security considerations for automated Terraform deployments
- Demo: Basic CI/CD Pipeline for Terraform on Google Cloud

Module 8: Course Wrap-up

- Recap of key Terraform for GCP concepts
- Recommended next steps and further learning resources
- Community resources and best practices
- Open discussion and Q&A

Your course overview ends here.
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About CloudThat

Established in 2012, CloudThat is an award-winning company and the first in India to offer cloud training and consulting services for individuals and enterprises worldwide. Recently, it won Google Cloud's New Training Partner of the Year Award for 2025, becoming the first company in the world in 2025 to hold awards from all three major cloud giants: AWS, Microsoft, and Google. CloudThat notably won consecutive AWS Training Partner of the Year (APJ) awards in 2023 and 2024 and the Microsoft Training Services Partner of the Year Award in 2024, bringing its total award count to an impressive 12 awards in the last 8 years.

CloudThat specializes in Cloud Migration, Data Platforms, DevOps, IoT, and cutting-edge technologies like Gen AI & AI/ML. As a Microsoft Solutions Partner, AWS Premier Tier Training Partner, Google Cloud Platform Partner, and collaborator with leading organizations like HPE, Oracle, Nvidia and Databricks, CloudThat has trained over 850,000 professionals across 600+ cloud certifications, empowering students and professionals worldwide to advance their skills and careers.

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