

Architecting Hybrid Cloud Infrastructure with Anthos

Course Summary

Description

This four-day, instructor-led course prepares students to modernize, manage, and observe their containerized applications using Kubernetes, in Google Cloud, AWS, Azure, and on-premises. Through presentations and hands-on labs, participants explore Google Kubernetes Engine (GKE), Connect Agent, Anthos Service Mesh and Anthos Config Management features. Participants learn how to work with containerized applications even when split between multiple clusters, hosted by multiple cloud providers or on-premises. This course is a continuation of Architecting with GKE and assumes direct experience with the technologies covered in that course.

Objectives

At the end of this course, students will be able to:

- Explain each layer of the Anthos technology stack and the problems it is designed to address.
- Create, connect and manage Anthos clusters from multiple deployment environments.
- Load-balance clusters running in Google Cloud.
- Describe automating policy and security at scale with Config Management.
- Create multi-cluster networking architectures with Anthos Service Mesh.
- Deploy and run applications on an Anthos on-premises solution.
- Monitor and troubleshoot applications running on an Anthos on-premises solution.
- Install workloads on Cloud Run and Cloud Run for Anthos.
- Configure and review logging, metrics, and monitoring for serverless computing solutions on Anthos.
- Install and use Migrate for Anthos to migrate workloads.

Topics

- Introducing Anthos
- Anthos Environments
- Multi-cluster Concepts on Anthos
- Managing Configuration with Anthos
- Introducing Anthos Service Mesh
- Anthos Service Mesh Routing
- Securing Network Traffic with Anthos Service Mesh
- Multi-cluster Networking with Anthos Service Mesh
- Introduction to Anthos Clusters on Bare Metal
- Planning and Building the Admin Cluster
- Adding and Configuring User Clusters
- Operating and Managing Clusters
- Application Migration with Anthos
- Modern CI/CD for Anthos
- Serverless Computing Solutions on Anthos

Audience

- Technical employees using GCP, including customer companies, partners and system integrators: deployment engineers, cloud architects, cloud administrators, system engineers, and SysOps/DevOps engineers.
- Individuals using GCP to create, integrate, or modernize solutions using secure, scalable microservices architectures in hybrid environments.

Prerequisites

To get the most out of this course, participants should have:

- Completed Google Cloud Platform Fundamentals: Core Infrastructure or have equivalent experience;
- Completed Architecting with GKE or have equivalent experience.

Duration

Four days

Architecting Hybrid Cloud Infrastructure with Anthos

Course Outline

I. *Introducing Anthos*

- A. Overview
- B. Anthos technology stack
- C. Anthos components
- D. Billing

II. *Anthos Environments*

- A. Containers and GKE Review
- B. Anthos for centrally managed clusters
- C. Creating and managing Anthos clusters
- D. Anthos clusters on AWS
- E. Anthos clusters on Azure

III. *Multi-cluster concepts on Anthos*

- A. Anthos fleets
- B. Fleet networking
- C. Multi-cluster Service
- D. Multi-cluster Gateway

IV. *Managing Configuration with Anthos*

- A. Challenges with configuration management
- B. Anthos Config Management
- C. Config Sync
- D. Hierarchy Controller
- E. Policy Controller
- F. Config Connector
- G. Blueprints

V. *Introducing Anthos Service Mesh*

- A. Introduction to Anthos Service Mesh
- B. Architecture
- C. Installation
- D. Life of a request in the mesh
- E. Mesh telemetry and instrumentation
- F. Anthos Service Mesh dashboards
- G. Anthos Service Mesh pricing and support

VI. *Anthos Service Mesh Routing*

- A. Networking and service discovery
- B. Anthos Service Mesh API resources
- C. Network resilience and testing

VII. *Securing Network Traffic with Anthos Service Mesh*

- A. Security across services
- B. Authentication and encryption
- C. Service authentication in the mesh
- D. End-user authentication in the mesh
- E. Authorization in the mesh
- F. Bonus: Employee authentication and authorization in the mesh

VIII. *Multi-cluster Networking with Anthos Service Mesh*

- A. Fleet networking
- B. Single network east-west routing
- C. Multiple network east-west routing
- D. North-south routing

IX. *Introduction to Anthos Clusters on Bare Metal*

- A. Overview
- B. Use cases for clusters on-premises
- C. Anthos on bare metal specifics
- D. Components and services
- E. Support
- F. Billing

X. *Planning and Building the Admin Cluster*

- A. Architecture
- B. Resource requirements
- C. Setting up the admin workstation
- D. Building the admin cluster
- E. Troubleshooting the admin bootstrap process
- F. Additional architectural options

XI. *Adding and Configuring User Clusters*

- A. Building the user cluster
- B. Enabling authentication
- C. Deploying applications
- D. Configuring storage

XII. *Operating and Managing Clusters*

- A. Observability
- B. Logging
- C. Monitoring
- D. Operations
- E. Security

XIII. *Application Migration with Anthos*

- A. Modernization vision
- B. Workload discovery and migration assessment
- C. Migrating applications to containers

XIV. *Modern CI/CD for Anthos*

- A. CI/CD in Google Cloud
- B. CI/CD in a private network
- C. CI/CD on-premises and multi-cloud environments
- D. Securing the software supply chain
- E. Deploying 3rd party software

XV. *Serverless Computing Solutions on Anthos*

- A. Overview of serverless computing solutions and their associated Anthos components
- B. Install Cloud Run for Anthos
- C. Running serverless workloads on Anthos