

## Architecting Hybrid Cloud Infrastructure with Anthos

**Course#:AT-AHCI**

**Duration:2 Days**

**Price:0.00**

### Course Description

This two-day instructor-led course prepares students to modernize, manage, and observe their applications using Kubernetes whether the application is deployed on-premises or on Google Cloud Platform (GCP). Through presentations, and hands-on labs, participants explore and deploy using Kubernetes Engine (GKE), GKE Connect, Istio service mesh and Anthos Config Management capabilities that enable operators to work with modern applications even when split among multiple clusters hosted by multiple providers, or on-premises.

### Objectives

Connect and manage Anthos GKE clusters from GCP Console whether clusters are part of Anthos on Google Cloud or Anthos deployed on VMware.

Understand how service mesh proxies are installed, configured and managed.

Configure centralized logging, monitoring, tracing, and service visualizations wherever the Anthos GKE clusters are hosted.

Understand and configure fine-grained traffic management.

Use service mesh security features for service-service authentication, user authentication, and policy-based service authorization.

Install a multi-service application spanning multiple clusters in a hybrid environment. Understand how services communicate across clusters.

Migrate services between clusters.

Install Anthos Config Management, use it to enforce policies, and explain how it can be used across multiple clusters.

### Audience

This class is primarily intended for the following participants:

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 the Architecting with Google Kubernetes Engine course and its prerequisites, or have equivalent experience.

## **Content**

The course includes presentations and hands-on labs.

### Module 1: Anthos Overview

Describe challenges of hybrid cloud

Discuss modern solutions

Describe the Anthos Technology Stack

### Module 2: Managing Hybrid Clusters using Kubernetes Engine

Understand Anthos GKE hybrid environments, with Admin and User clusters

Register and authenticate remote Anthos GKE clusters in GKE Hub

View and manage registered clusters, in cloud and on-premises, using GKE Hub

View workloads in all clusters from GKE Hub

Lab: Managing Hybrid Clusters using Kubernetes Engine

### Module 3: Introduction to Service Mesh

- Understand service mesh, and problems it solves
- Understand Istio architecture and components
- Explain Istio on GKE add on and its lifecycle, vs OSS Istio
- Understand request network traffic flow in a service mesh
- Create a GKE cluster, with a service mesh
- Configure a multi-service application with service mesh
- Enable external access using an ingress gateway
- Explain the multi-service example applications: Hipster Shop, and Bookinfo
- Lab: Installing Open Source Istio on Kubernetes Engine
- Lab: Installing the Istio on GKE Add-On with Kubernetes Engine

### Module 4: Observing Services using Service Mesh Adapters

- Understand service mesh flexible adapter model
- Understand service mesh telemetry processing
- Explain Stackdriver configurations for logging and monitoring
- Compare telemetry defaults for cloud and on-premises environments
- Configure and view custom metrics using service mesh
- View cluster and service metrics with pre-configured dashboards
- Trace microservice calls with timing data using service mesh adapters
- Visualize and discover service attributes with service mesh
- Lab: Telemetry and Observability with Istio

### Module 5: Managing Traffic Routing with Service Mesh

- Understand the service mesh abstract model for traffic management
- Understand service mesh service discovery and load balancing

Review and compare traffic management use cases and configurations  
Understand ingress configuration using service mesh  
Visualize traffic routing with live generated requests  
Configure a service mesh gateway to allow access to services from outside the mesh  
Apply virtual services and destination rules for version-specific routing  
Route traffic based on application-layer configuration  
Shift traffic from one service version to another, with fine-grained control, like a canary deployment  
Lab: Managing Traffic Routing with Istio and Envoy

## Module 6: Managing Policies and Security with Service Mesh

Understand authentication and authorization in service mesh  
Explain mTLS flow for service to service communication  
Adopt mutual TLS authentication across the service mesh incrementally  
Enable end-user authentication for the frontend service  
Use service mesh access control policies to secure access to the frontend service  
Lab: Managing Policies and Security with Service Mesh

## Module 7: Managing Policies using Anthos Config Management

Understand the challenge of managing resources across multiple clusters  
Understand how a Git repository is as a configuration source of truth  
Explain the Anthos Config Management components, and object lifecycle  
Install and configure Anthos Config Management, operators, tools, and related Git repository  
Verify cluster configuration compliance and drift management  
Update workload configuration using repo changes  
Lab: Managing Policies in Kubernetes Engine using Anthos Config

## Module 8: Configuring Anthos GKE for Multi-Cluster Operation

Understand how multiple clusters work together using DNS, root CA, and service discovery

Explain service mesh control-plane architectures for multi-cluster

Configure a multi-service application using service mesh across multiple clusters with multiple control-planes

Configure a multi-service application using service mesh across multiple clusters with a shared control-plane

Configure service naming/discovery between clusters

Review ServiceEntries for cross-cluster service discovery

Migrate workload from a remote cluster to an Anthos GKE cluster

Lab: Configuring GKE for Multi-Cluster Operation with Istio

Lab: Configuring GKE for Shared Control Plane Multi-Cluster Operation