KOENIG SOLUTIONS · COURSE OUTLINE

Architecting Hybrid Cloud Infrastructure with Anthos

Learn to architect, secure and operate hybrid cloud infrastructure across clusters using Anthos, GKE and service mesh.

8	50	9
MODULES	TOPICS	HANDS-ON LABS

COURSE OVERVIEW

This course covers the Anthos technology stack and the challenges of hybrid cloud, followed by managing hybrid clusters across cloud and on-premises environments using GKE Hub. It then examines service mesh with Istio, including observability with telemetry adapters, traffic routing and version-specific control, and policy and security management with mutual TLS and access control. The final modules address managing policies across clusters with Anthos Config Management and configuring GKE for multi-cluster operation with shared or multiple control planes.

WHO THIS COURSE IS FOR

- **Cloud Architects**
- **Platform Engineers**
- **DevOps Engineers**
- **Infrastructure Administrators**
- **Kubernetes Administrators**

LEARNING OBJECTIVES

- Describe the challenges of hybrid cloud and the Anthos technology stack
- Manage hybrid clusters in cloud and on-premises environments using GKE Hub
- Explain Istio architecture and its service mesh traffic flow
- Configure a multi-service application with service mesh and ingress gateway
- Trace and visualise service metrics using service mesh adapters
- Apply virtual services and destination rules for traffic routing
- Adopt mutual TLS authentication and access control policies
- Configure Anthos Config Management and multi-cluster GKE operation

COURSE SYLLABUS

8 Modules, 50 Topics

01

Anthos Overview

TOPICS

Describe challenges of hybrid cloud · Discuss modern solutions · Describe the Anthos Technology Stack

02

Lab

Managing Hybrid Clusters Using Kubernetes Engine

TOPICS

- 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

03

2 Labs

Introduction to Service Mesh

TOPICS

- Understand service mesh, and problems it solves
- Understand Istio architecture and components
- Explain Istio on GKE add on and it's 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

04

Lab

Observing Services Using Service Mesh Adapters

TOPICS

- 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

05

Lab

Managing Traffic Routing with Service Mesh

TOPICS

- 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

06

Lab

Managing Policies and Security with Service Mesh

TOPICS

- 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

07

Lab

Managing Policies Using Anthos Config Management

TOPICS

- 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

08

2 Labs

Configuring Anthos GKE for Multi-Cluster Operation

TOPICS

- 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

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
02	**Managing Hybrid Clusters Using Kubernetes Engine**	Managing Hybrid Clusters using Kubernetes Engine
03	**Introduction to Service Mesh**	■ Installing Open Source Istio on Kubernetes Engine ■ Installing the Istio on GKE Add-On with Kubernetes Engine
04	**Observing Services Using Service Mesh Adapters**	Telemetry and Observability with Istio
05	**Managing Traffic Routing with Service Mesh**	Managing Traffic Routing with Istio and Envoy
06	**Managing Policies and Security with Service Mesh**	Managing Policies and Security with Service Mesh

#	MODULE	ACTIVITY
07	**Managing Policies Using Anthos Config Management**	Managing Policies in Kubernetes Engine using Anthos Config
08	**Configuring Anthos GKE for Multi-Cluster Operation**	■ Configuring GKE for Multi-Cluster Operation with Istio ■ Configuring GKE for Shared Control Plane Multi-Cluster Operation

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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