Architecting Hybrid Cloud Infrastructure with Anthos

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 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
- 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