

Architecting with Google Kubernetes Engine

The best course to master Google Kubernetes Engine

3 jour(s) / 21h

Learning outcomes

- Understand how software containers work.
- Understand the architecture of Kubernetes.
- Understand the architecture of Google Cloud.
- Understand how pod networking works in Google Kubernetes Engine.
- Create and manage Kubernetes Engine clusters using the Google Cloud Console and `gcloud/kubectl` commands.
- Launch, roll back, and expose jobs in Kubernetes.
- Manage access control using Kubernetes RBAC and IAM.
- Manage pod security policies and network policies.
- Use Secrets and ConfigMaps to isolate security credentials and configuration artifacts.
- Understand Google Cloud choices for managed storage services.
- Monitor applications running in Google Kubernetes Engine.

Target audience

- Cloud architects, administrators, and SysOps/DevOps personnel
- Individuals using Google Cloud to create new solutions or to integrate existing systems, application environments, and infrastructure with Google Cloud.

Prerequisites

- Completed “Google Cloud Fundamentals: Core Infrastructure” or have equivalent experience

Course Outline

Module 1: Introduction to Google Cloud Platform

- Use the Google Cloud Console
- Use Cloud Shell
- Define Cloud Computing
- Identify Google Cloud Compute Services
- Understand Regions and Zones
- Understand the Cloud Resource Hierarchy
- Administer your Google Cloud Resources

Module 2, Containers and Kubernetes in GCP

- Create a Container Using Cloud Build
- Store a Container in Container Registry
- Understand the Relationship Between Kubernetes and Google Kubernetes Engine (GKE)
- Understand how to Choose Among Google Cloud Compute Platforms

Module 3: Kubernetes Architecture

- Understand the Architecture of Kubernetes: Pods, Namespaces
- Understand the Control-plane Components of Kubernetes
- Create Container Images using Cloud Build
- Store Container Images in Container Registry
- Create a Kubernetes Engine Cluster

Module 4: Kubernetes Operations

- Work with the Kubectl Command.
- Inspect the Cluster and Pods.
- View a Pod’s Console Output.
- Sign in to a Pod Interactively.

Module 5: Deployments, Jobs, and Scaling

- Deployments
- Ways to Create Deployments
- Services and Scaling
- Updating Deployments
- Rolling Updates
- Blue/Green Deployments
- Canary Deployments
- Managing Deployments
- Jobs and CronJobs
- Parallel Jobs
- CronJobs
- Cluster Scaling
- Downscaling
- Node Pools
- Controlling Pod Placement
- Affinity and Anti-Affinity
- Pod Placement Example
- Taints and Tolerations
- Getting Software into your Cluster

Module 6: GKE Networking

- Introduction
- Pod Networking
- Services
- Finding Services
- Service Types and Load Balancers
- How Load Balancers Work
- Ingress Resource
- Container-Native Load Balancing
- Network Security

Module 7: Persistent Data and Storage

- Volumes
- Volume Types
- The PersistentVolume Abstraction
- More on PersistentVolumes
- StatefulSets
- ConfigMaps
- Secrets

Module 8: Access Control and Security in Kubernetes and Kubernetes Engine

- Understand Kubernetes Authentication and Authorization
- Define Kubernetes RBAC Roles and Role Bindings for Accessing Resources in Namespaces
- Define Kubernetes RBAC Cluster Roles and ClusterRole Bindings for accessing Cluster-scoped Resources
- Define Kubernetes Pod Security Policies
- Understand the Structure of IAM
- Define IAM roles and Policies for Kubernetes Engine Cluster Administration

Module 9: Logging and Monitoring

- Use Cloud Monitoring to monitor and manage availability and performance
- Locate and inspect Kubernetes logs
- Create probes for wellness checks on live applications

Module 10: Using GCP Managed Storage Services from Kubernetes Applications

- Understand Pros and Cons for Using a Managed Storage Service Versus Self-managed Containerized Storage
- Enable Applications Running in GKE to Access Google Cloud Storage Services
- Understand Use Cases for Cloud Storage, Cloud SQL, Cloud Spanner, Cloud Bigtable, Cloud Firestore, and BigQuery from within a Kubernetes Application

Module 11: Logging and Monitoring

- CI/CD overview
- CI/CD for Google Kubernetes Engine
- CI/CD Examples
- Manage application code in a source repository that can trigger code changes to a continuous delivery pipeline.