# Architecting with Google Kubernetes Engine

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Course#:AT-GKE
Duration:3 Days
Price:0.00
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## Course Description

Learn how to deploy and manage containerized applications on Google Kubernetes Engine (GKE). Learn how to use other tools on Google Cloud that interact with GKE deployments. This course features a combination of lectures, demos, and hands-on labs to help you explore and deploy solution elementsincluding infrastructure components like pods, containers, deployments, and servicesalong with networks and application services. Youll also learn how to deploy practical solutions, including security and access management, resource management, and resource monitoring.

## Objectives

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.

## Audience

This class is intended for the following:

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

## Prerequisites

To get the most out of this course, participants should have: Completed Google Cloud Platform Fundamentals: Core Infrastructure or have equivalent experience Basic proficiency with command-line tools and Linux operating system environments

## Content

Module 1: Introducing Google Cloud Platform

Use the Google Cloud Platform Console
Use Cloud Shell
Define cloud computing
Identify GCPs compute services
Understand regions and zones
Understand the cloud resource hierarchy
Administer your GCP 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 GCP compute platforms

Module 3: Kubernetes Architecture

Understand the architecture of Kubernetes: pods, namespaces

Understand the control-plane components of Kubernetes

Create container images using Google Cloud Build

Store container images in Google Container Registry

Create a Kubernetes Engine cluster

## Module 4: Kubernetes Operations

Work with the kubectl command

Inspect the cluster and Pods

View a Pods console output

Sign in to a Pod interactively

## Module 5: Deployments, Jobs, and Scaling

Create and use Deployments

Create and run Jobs and CronJobs

Scale clusters manually and automatically

Configure Node and Pod affinity

Get software into your cluster with Helm charts and Kubernetes Marketplace

## Module 6: GKE Networking

Create Services to expose applications that are running within Pods

Use load balancers to expose Services to external clients

Create Ingress resources for HTTP(S) load balancing

Leverage container-native load balancing to improve Pod load balancing

Define Kubernetes network policies to allow and block traffic to pods

## Module 7: Persistent Data and Storage

Use Secrets to isolate security credentials

Use ConfigMaps to isolate configuration artifacts

Push out and roll back updates to Secrets and ConfigMaps

Configure Persistent Storage Volumes for Kubernetes Pods

Use StatefulSets to ensure that claims on persistent storage volumes persist across restarts

## 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 cluster role bindings for accessing cluster-scoped resources

Define Kubernetes pod security policies

Understand the structure of GCP IAM

Define IAM roles and policies for Kubernetes Engine cluster administration

## Module 9: Logging and Monitoring

Use Stackdriver 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 GCP 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.
 Create a continuous delivery pipeline using Cloud Build and start it manually or automatically with a code change.
 Implement a canary deployment that hosts two versions of your application in production for release testing.