

# Sela.

GCPAGKE

## Architecting with Google Kubernetes Engine

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# Architecting with Google Kubernetes Engine

GCPAGKE - Version: 1

 5 days 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 elements—including infrastructure components like pods, containers, deployments, and services—along with networks and application services. You'll also learn how to deploy practical solutions, including security and access management, resource management, and resource monitoring.

## Intended audience:

This class is intended for the following participants: 1) Cloud architects, administrators, and SysOps/DevOps personnel. 2) Individuals using Google Cloud to create new solutions or to integrate existing systems, application environments, and infrastructure with Google Cloud.

## Prerequisites:

1) Architecting with Google Kubernetes Engine - Foundations. 2) Architecting with Google Kubernetes Engine - Workloads

## Objectives:



Define Identity and Access Management roles for GKE, as well as Kubernetes pods security policies

Understand how logging is implemented in Kubernetes, and how GKE extends that basic functionality using Google Cloud's operations suite

Use Google Cloud Managed Storage Services with GKE

Use CI/CD with GKE

## Topics:

### Introduction to Google Cloud

- • 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

### Containers and Kubernetes in Google Cloud

- • 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

### 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

## Kubernetes Operations

- The Kubectl Command

## Deployment, 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



## 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

## Persistent Data and Storage

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

## 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

## Using Google Cloud 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

## Logging and Monitoring

- • CI/CD overview
- • CI/CD for Google Kubernetes Engine
- • CI/CD Examples