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Architecting with Google Kubernetes Engine

Course#:CA-GKE
Duration:3 Days
Price:0.00

Course Description

This three-day instructor-led class introduces participants to deploying and managing containerized applications on Google Kubernetes Engine (GKE) and the other services provided by Google Cloud Platform. Through a combination of presentations, demos, and hands-on labs, participants explore and deploy solution elements, including infrastructure components such as pods, containers, deployments, and services; as well as networks and application services. This course also covers deploying practical solutions including security and access management, resource management, and resource monitoring.

Objectives

This course teaches participants the following skills:

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

This three-day instructor-led class introduces participants to deploying and managing containerized applications on Google Kubernetes Engine (GKE) and the other services provided by Google Cloud Platform. Through a combination of presentations, demos, and hands-on labs, participants explore and deploy solution elements, including infrastructure components such as pods, containers, deployments, and services; as well as networks and application services. This course also covers deploying practical solutions including security and access management, resource management, and resource monitoring.

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