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Architecting with Google Kubernetes Engine

Course Code: GCPGKE
Duration: 3 days
Instructor-led Training (ILT) | Virtual Instructor-led Training (VILT)

OVERVIEW

Learn how to deploy and manage containerized applications on Google Kubernetes Engine (GKE) and the other tools on Google Cloud. 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.

SKILLS COVERED

This course teaches participants the following skills:

- 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 Google Kubernetes Engine clusters using the Cloud Console and gcloud/ kubectl commands.
- Launch, roll back and expose jobs in Kubernetes.
- Manage access control using Kubernetes RBAC and Cloud 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.

WHO SHOULD ATTEND

This class is intended for the following participants:

- 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.

MODULES

Module 1: Introduction to Google Cloud

- Identify Google Cloud services and their function.
- Choose the right Google Cloud services to create your own Cloud solution.

Module 2: Containers and Kubernetes in Google Cloud

- Create a container using Cloud Build.
- Store a container in Container Registry.
- Compare and contrast Kubernetes and GKE features.

Module 3: Kubernetes Architecture

- Conceptualize the Kubernetes architecture.
- Deploy a Kubernetes cluster using GKE.
- Deploy pods to a GKE cluster.
- View and manage Kubernetes objects.

- Conceptualize the migrate for Anthos process.

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: Deployment, 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

- Define IAM roles and policies for GKE.
- Define Kubernetes RBAC roles and role bindings.
- Define Kubernetes pod security policies.

Module 9: Logging and Monitoring

- Create forensic logs for systems monitoring.
- Monitor your system performance from different vantage points.
- Create probes for wellness checks on live applications.

Module 10: Using Google Cloud Managed Storage Services from Kubernetes Applications

- Understand use cases for Cloud Storage within a Kubernetes application.
- Understand use cases for Cloud SQL and Cloud Spanner within a Kubernetes application.
- Understand use cases for Datastore within a Kubernetes application.
- Understand use cases for Cloud Bigtable within a Kubernetes application.

Module 11: Logging and Monitoring

- 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.