Developing Applications with Google Cloud

Overview

Learn how to design, develop, and deploy applications that seamlessly integrate components from the Google Cloud ecosystem. This course uses lectures, demos, and hands-on labs to show you how to use Google Cloud services and pre-trained machine learning APIs to build secure, scalable, and intelligent cloud-native applications.

Prerequisite Comments

Completed Google Cloud Platform Fundamentals or have equivalent experience
Working knowledge of Node.js, Python, or Java
Basic proficiency with command-line tools and Linux operating system environments

Target Audience

Application developers who want to build cloud-native applications or redesign existing applications that will run on Google Cloud Platform

Course Objectives

This course teaches participants the following skills:
Use best practices for application development.
Choose the appropriate data storage option for application data.
Implement federated identity management.
Develop loosely coupled application components or microservices.
Integrate application components and data sources.
Debug, trace, and monitor applications.
Perform repeatable deployments with containers and deployment services.
Choose the appropriate application runtime environment; use Google Container Engine as a runtime environment and later switch to a no-ops solution with Google App Engine flexible environment.

Course Outline

1 - Best Practices for Application Development

Code and environment management.
Design and development of secure, scalable, reliable, loosely coupled application components and microservices.
Continuous integration and delivery.
Re-architecting applications for the cloud.

2 - Google Cloud Client Libraries, Google Cloud SDK, and Google Firebase SDK

How to set up and use Google Cloud Client Libraries, Google Cloud SDK, and Google Firebase SDK.
Lab: Set up Google Client Libraries, Cloud SDK, and Firebase SDK on a Linux instance and set up application credentials.

3 - Overview of Data Storage Options

Overview of options to store application data.
Use cases for Google Cloud Storage, Cloud Firestore, Cloud Bigtable, Google Cloud SQL, and Cloud Spanner.

4 - Best Practices for Using Cloud Firestore

Best practices related to using Cloud Firestore in Datastore mode for:Queries, Built-in and composite indexes, Inserting and deleting data (batch operations),Transactions,Error handling.
Bulk-loading data into Cloud Firestore by using Google Cloud Dataflow.
Lab: Store application data in Cloud Datastore.

5 - Performing Operations on Cloud Storage

Operations that can be performed on buckets and objects.
Consistency model.
Error handling.

6 - Best Practices for Using Cloud Storage

Naming buckets for static websites and other uses.
Naming objects (from an access distribution perspective).
Performance considerations.
Setting up and debugging a CORS configuration on a bucket.
Lab: Store files in Cloud Storage.

7 - Handling Authentication and Authorization

Cloud Identity and Access Management (IAM) roles and service accounts.
User authentication by using Firebase Authentication.
User authentication and authorization by using Cloud Identity-Aware Proxy.
Lab: Authenticate users by using Firebase Authentication.

8 - Using Pub/Sub to Integrate Components of Your Application

Topics, publishers, and subscribers.
Pull and push subscriptions.
Use cases for Cloud Pub/Sub.
Lab: Develop a backend service to process messages in a message queue.

9 - Adding Intelligence to Your Application

Overview of pre-trained machine learning APIs such as Cloud Vision API and Cloud Natural Language Processing API.

10 - Using Cloud Functions for Event-Driven Processing

Key concepts such as triggers, background functions, HTTP functions.
Use cases.
Developing and deploying functions.
Logging, error reporting, and monitoring.

11 - Managing APIs with Cloud Endpoints

Open API deployment configuration.
Lab: Deploy an API for your application.

12 - Deploying Applications

Creating and storing container images.
Repeatable deployments with deployment configuration and templates.
Lab: Use Deployment Manager to deploy a web application into Google App Engine flexible environment test and production environments.

13 - Execution Environments for Your Application

Considerations for choosing an execution environment for your application or service:Google Compute Engine (GCE),Google Kubernetes Engine (GKE), App Engine flexible environment, Cloud Functions, Cloud Dataflow, Cloud Run.
Lab: Deploying your application on App Engine flexible environment.

14 - Debugging, Monitoring, and Tuning Performance

Application Performance Management Tools.
Stackdriver Debugger.
Stackdriver Error Reporting.
Lab: Debugging an application error by using Stackdriver Debugger and Error Reporting.
Stackdriver Logging.
Key concepts related to Stackdriver Trace and Stackdriver Monitoring.
Lab: Use Stackdriver Monitoring and Stackdriver Trace to trace a request across services, observe, and optimize performance.

Related Courses, Certifications, Exams

- Google Cloud Fundamentals - Core Infrastructure