Developing Applications with Google Cloud Training

Duration: **3 Day**

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Developing Applications with Google Cloud is designed for application developers who want to build applications that make effective use of services across the **Google Cloud ecosystem**.

Throughout the course, participants explore how Google Cloud services can be incorporated into application architectures, how different data storage solutions can be selected for specific requirements, and how authentication, authorisation and communication between application components can be implemented.

The programme also covers integrating pre-trained machine learning APIs, developing event-driven functions, managing APIs, deploying applications across different execution environments, and monitoring and improving application performance.

Combining instructor presentations, demonstrations and hands-on labs, the course gives developers practical experience in creating **secure, scalable and intelligent cloud-native applications** on Google Cloud.

Who Should Attend

This course is intended for:

- Application developers who want to create cloud-native applications on Google Cloud Platform
- Developers who need to redesign existing applications so that they can run effectively on Google Cloud

Training Outline

Module 1 — Application Development Best Practices

Explore the core design and development practices used when creating applications for cloud environments.

- Managing code and development environments
- Designing secure, scalable and reliable application components
- Developing loosely coupled architectures
- Designing and developing microservices
- Continuous Integration and Continuous Delivery
- Re-architecting existing applications for the cloud

Module 2 — Google Cloud Client Libraries, Cloud SDK and Firebase SDK

Learn how the principal SDKs and client libraries can be configured and used during Google Cloud application development.

- Setting up and using Google Cloud Client Libraries
- Configuring Google Cloud SDK
- Working with Firebase SDK
- Configuring application credentials

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Lab: Set up Google Client Libraries, Google Cloud SDK and Firebase SDK on a Linux instance and configure application credentials.

Module 3 — Data Storage Options

Compare the different services available for storing application data in Google Cloud.

- Application data storage options
- Google Cloud Storage use cases
- Google Cloud Datastore
- Cloud Bigtable
- Google Cloud SQL
- Cloud Spanner
- Selecting storage services according to application requirements

Module 4 — Best Practices for Google Cloud Datastore

Explore practical approaches for working effectively with data in Cloud Datastore.

- Queries
- Built-in and composite indexes
- Batch insertion and deletion operations
- Transactions
- Error handling
- Bulk loading data into Cloud Datastore with Google Cloud Dataflow

Lab: Store application data in Cloud Datastore.

Module 5 — Working with Buckets and Objects

Examine the operations available when managing buckets and objects.

- Operations performed on buckets
- Object operations
- Consistency model
- Error handling

Module 6 — Best Practices for Google Cloud Storage

Explore approaches for using Cloud Storage effectively across different application scenarios.

- Naming buckets for static websites and other use cases
- Object naming from an access-distribution perspective
- Performance considerations
- Configuring CORS on a bucket
- Troubleshooting CORS configurations

Lab: Store files in Cloud Storage.

Module 7 — Authentication and Authorisation

Learn how users and services can be securely authenticated and authorised.

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- Cloud Identity and Access Management (IAM) roles
- Service accounts
- User authentication with Firebase Authentication
- Authentication and authorisation with Cloud Identity-Aware Proxy

Lab: Authenticate users with Firebase Authentication.

Module 8 — Integrating Application Components with Cloud Pub/Sub

Explore how Cloud Pub/Sub can support message-based communication between application components.

- Topics
- Publishers and subscribers
- Pull subscriptions
- Push subscriptions
- Cloud Pub/Sub use cases

Lab: Develop a backend service that processes messages from a message queue.

Module 9 — Adding Intelligence to Applications

Explore how Google's pre-trained machine learning capabilities can be incorporated into applications.

- Overview of pre-trained machine learning APIs
- Cloud Vision API
- Cloud Natural Language Processing API
- Integrating ML capabilities into applications

Module 10 — Event-Driven Processing with Google Cloud Functions

Learn how serverless functions can respond to events and HTTP requests.

- Triggers
- Background functions
- HTTP functions
- Cloud Functions use cases
- Developing and deploying functions
- Logging
- Error reporting
- Monitoring

Module 11 — Managing APIs with Google Cloud Endpoints

Explore how application APIs can be configured and deployed.

- Google Cloud Endpoints
- OpenAPI deployment configuration
- API deployment workflow

Lab: Deploy an API for an application.

Module 12 — Deployment with Cloud Build, Container Registry and Deployment

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Manager

Learn how applications can be packaged and deployed through repeatable deployment processes.

- Creating container images
- Storing container images
- Deployment configurations
- Deployment templates
- Creating repeatable deployments

Lab: Use Deployment Manager to deploy a web application to App Engine flexible environment test and production environments.

Module 13 — Application Execution Environments

Compare Google Cloud execution environments and consider which option is appropriate for different application and service requirements.

- Google Compute Engine
- Kubernetes Engine
- App Engine flexible environment
- Cloud Functions
- Cloud Dataflow
- Selecting an execution environment according to application requirements

Lab: Deploy an application on App Engine flexible environment.

Module 14 — Debugging, Monitoring and Performance Tuning

Explore tools for identifying application problems, monitoring services and analysing performance.

- Stackdriver Debugger
- Stackdriver Error Reporting
- Stackdriver Logging
- Stackdriver Trace
- Stackdriver Monitoring
- Tracing requests across services
- Observing and optimising application performance

Labs:

- Diagnose an application error with Stackdriver Debugger and Error Reporting
- Use Stackdriver Monitoring and Trace to follow a request across services and evaluate application performance