



Application Development with Cloud Run

Course description

In this course, you will dive deep into Application Development with Cloud Run, Google Cloud's fully managed serverless platform for containerized applications. You will learn the fundamental concepts of serverless container deployment, from preparing your application for containerization to deploying, managing, and scaling services on Cloud Run. The course covers practical aspects such as configuring service settings, integrating with other Google Cloud services, implementing CI/CD pipelines, and ensuring optimal performance and cost efficiency for your applications. By the end of this course, you will have the skills to build, deploy, and manage highly scalable and resilient serverless applications using Cloud Run.

- Course level: Intermediate to Advanced
- Duration: 2 days

Activities

This course includes presentations, hands-on labs, demonstrations, and group exercises and discussions.

Course objectives

In this course, you will learn to:

- Summarize the core architecture, benefits, and use cases of Google Cloud Run
- Prepare and containerize applications using Docker best practices for Cloud Run deployment
- Deploy, configure, and manage Cloud Run services, including traffic splitting and revision management
- Integrate Cloud Run applications with various Google Cloud services such as databases, messaging queues, and storage
- Implement robust CI/CD pipelines for automated application deployments to Cloud Run
- Apply security best practices, monitor service health, and optimize performance and cost for Cloud Run services
- Design and implement scalable, resilient, and event-driven applications using Cloud Run and related GCP services

Intended audience

This course is intended for software professionals who want to leverage serverless containerization:

- Software Developers
- DevOps Engineers
- Cloud Architects
- Backend Developers
- Solution Architects
- Technical Leads

Prerequisites

We recommend that attendees of this course have:

- Familiarity with containerization concepts and Docker
- Basic understanding of cloud computing principles
- Experience with a programming language (e.g., Node.js, Python, Go, Java)
- Familiarity with command-line interfaces and basic Git operations

Course outline

Module 1: Introducing Cloud Run

- Serverless Computing Landscape and Benefits

- What is Google Cloud Run? (Managed Cloud Run vs. Cloud Run on GKE)
- Key Features and Advantages: Containers, Auto-scaling, Pay-per-use, Language Agnostic
- Ideal Use Cases for Cloud Run (Web services, APIs, event-driven functions, batch jobs)
- Demo: Deploying a "Hello World" service to Cloud Run

Module 2: Containerizing Applications for Cloud Run

- Docker Fundamentals Refresher: Images, Containers, Registries
- Best Practices for Dockerfile Creation and Optimization
- Building and Pushing Container Images to Google Container Registry and Artifact Registry
- Local Development Workflow with Docker Compose for Cloud Run parity
- Hands-on Lab: Containerizing a simple Node.js (or Python/Go) web application

Module 3: Deploying and Managing Cloud Run Services

- Deployment Strategies: gcloud CLI, Cloud Console, YAML Configurations
- Service Revisions and Traffic Management (Rollouts, Rollbacks, Traffic Splitting)
- Environment Variables, Secret Management with Secret Manager, and Configuration Files
- Custom Domains, Managed SSL Certificates, and Ingress Settings
- CPU Allocation, Concurrency Settings, and Resource Limits
- Hands-on Lab: Deploying a multi-revision service with blue/green deployment and traffic splitting

Module 4: Integrating with Google Cloud Services

- Connecting to Databases: Cloud SQL, Firestore, BigQuery
- Event-Driven Architectures: Pub/Sub, Eventarc, Cloud Scheduler
- Utilizing Cloud Storage for Persistent Data
- Identity and Access Management (IAM) for Cloud Run Services and Service Accounts
- Securely Calling Other Cloud Run Services and External APIs
- Hands-on Lab: Building an event-driven service that processes Pub/Sub messages and stores data in Firestore

Module 5: Advanced Cloud Run Features and Patterns

- Cloud Run Jobs: For Batch Processing and Scheduled Tasks
- Networking with VPC Access Connector for Private Network Resources
- Service-to-Service Authentication and Authorization
- Observability: Structured Logging with Cloud Logging and Monitoring with Cloud Monitoring
- Troubleshooting Common Cloud Run Issues (Cold starts, resource limits, connectivity)
- Hands-on Lab: Implementing a scheduled batch job to clean up old data using Cloud Run Jobs

Module 6: CI/CD for Cloud Run Applications

- Introduction to Continuous Integration and Continuous Delivery on Google Cloud
- Cloud Build for Automated Container Image Builds and Deployments
- Automating Deployments with Git Repositories (GitHub, GitLab, Cloud Source Repositories)
- Integrating Testing Frameworks into the CI/CD Pipeline
- Implementing Blue/Green and Canary Deployment Strategies with Cloud Build
- Demo: Setting up a basic CI/CD pipeline for a Cloud Run service

Module 7: Security, Performance, and Cost Optimization

- Security Best Practices: Least Privilege, Secure Dockerfiles, Vulnerability Scanning
- Resource Allocation, Scalability Limits, and Cost Management Strategies
- Performance Tuning: Minimizing Cold Starts, Optimizing Concurrency, and Resource Provisioning
- Regional Considerations and Multi-Region Deployment Strategies
- Hands-on Lab: Optimizing a Cloud Run service for cost efficiency and performance, including cold start mitigation

Module 8: Course Wrap-up

- Review of Key Concepts and Best Practices for Production-Ready Cloud Run Applications
- Case Studies and Real-World Examples of Cloud Run Deployments
- Future Trends and Roadmap for Cloud Run and Serverless Computing
- Q&A Session and Additional Resources for Continued Learning

Your course overview ends here.
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About CloudThat

Established in 2012, CloudThat is an award-winning company and the first in India to offer cloud training and consulting services for individuals and enterprises worldwide. Recently, it won Google Cloud's New Training Partner of the Year Award for 2025, becoming the first company in the world in 2025 to hold awards from all three major cloud giants: AWS, Microsoft, and Google. CloudThat notably won consecutive AWS Training Partner of the Year (APJ) awards in 2023 and 2024 and the Microsoft Training Services Partner of the Year Award in 2024, bringing its total award count to an impressive 12 awards in the last 8 years.

CloudThat specializes in Cloud Migration, Data Platforms, DevOps, IoT, and cutting-edge technologies like Gen AI & AI/ML. As a Microsoft Solutions Partner, AWS Premier Tier Training Partner, Google Cloud Platform Partner, and collaborator with leading organizations like HPE, Oracle, Nvidia and Databricks, CloudThat has trained over 850,000 professionals across 600+ cloud certifications, empowering students and professionals worldwide to advance their skills and careers.

To know more about our cloud certification training, email at sales@cloudthat.com or call us at [+91-8880002200](tel:+91-8880002200) or [+1-8555588830](tel:+1-8555588830) for those from outside India.