

# Google Professional Cloud Developer Exam Guide

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*Ace the Google Professional Cloud Developer  
Exam with this comprehensive guide*

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**Fiifi Baidoo**



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**Dedicated to**

*My mother:*

***Dr. Ama Beduwa Maison***

*&*

*My daughter:*

***Beduwa Baidoo***

## About the Author

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He runs a blog, in which he focuses on cloud computing, software engineering, and digital transformation. His discussions cover critical areas such as secret management, IAM roles and permissions, and least privileged access. He provides insights to help readers protect their cloud applications from potential threats, including DDoS attacks and the application of Cloud Armor for defensive measures.

As the Founder and Chief Architect of CLOUDPORT, he partners with organizations to transform their cloud infrastructure and deployments for optimal performance.

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"The Google Professional Cloud Developer Exam Guide" is as much a product of your efforts as it is mine. Thank you for helping me bring this dream to fruition.

## Preface

Welcome to **The Google Professional Cloud Developer Exam Guide**, a comprehensive resource meticulously designed to guide you through acquiring the Google Professional Cloud Developer certification. This book serves as a lighthouse, illuminating the path to mastering the art and science of cloud development.

The world of technology is constantly evolving, and in this dynamic landscape, possessing a Google Professional Cloud Developer certification is not just an advantage—it is a necessity. It is a testament to your expertise in building scalable, secure, and efficient cloud-native applications using Google's state-of-the-art infrastructure.

Our journey begins with an overview of the Google Cloud Platform and its myriad services, offering you a bird's eye view of the landscape you'll be navigating. This guide does not merely provide theoretical knowledge; it equips you with practical skills. With engaging demos and practice exercises at the end of each chapter, you can immediately apply what you have learned, reinforcing your understanding and readiness for the certification exam.

Our ultimate goal is to empower you to pass the Google Professional Cloud Developer certification exam successfully. But the journey doesn't end there. The concepts, techniques, and best practices you learn here will continue to serve you in your professional endeavors, helping you build robust and efficient cloud-native applications that make the most of Google's powerful infrastructure.

As we delve deeper, each of the 11 chapters will unravel a different facet of cloud development—from Operations APIs to Machine Learning APIs, from creating a custom VPC to designing high-performance applications. The details of the chapters are listed below.

**Chapter 1: The Professional Cloud Developer** - This chapter comprehensively overviews the Google Certified Professional Cloud Developer certification exam. It provides insights into designing a study plan, using resources effectively, and registering for the exam.

**Chapter 2: Development Environments** - This chapter guides you through setting up your development environment on the Google Cloud Platform. It covers

creating Google Cloud projects, using the command-line interface, navigating the Google Cloud Console, and understanding Cloud Shell tools and Cloud Code. The chapter includes demos and practice exercises to solidify your understanding.

**Chapter 3: GCP Products and Services** - This chapter offers an overview of relevant products and services on GCP. It covers various topics, including compute, serverless, storage, databases, application integration, networks, operations, CI/CD, tools, big data, and artificial intelligence. You'll also find demos, practice exercises, and quizzes to test your knowledge.

**Chapter 4: Designing High-performance Applications** - You will learn about Google's recommended best practices for building scalable applications and APIs here. The chapter covers designing microservices, understanding different cloud options, managing application user sessions and caching, deploying and securing API services, and scaling for increased demand. Demonstrations and practice exercises are included to facilitate learning.

**Chapter 5: Designing and Managing Secure Applications** - This chapter discusses crucial considerations for designing secure cloud applications. Topics include secret keys, Google services authentication, IAM roles & permissions, service accounts, least privileged access, and certificate-based authentication. Demos, practice exercises, and quizzes are included to reinforce the concepts learned.

**Chapter 6: Writing and Building Cloud-native Applications** - In this chapter, you will delve into writing, testing, and building efficient code for cloud-native applications. The chapter covers modern application patterns, debugging and profiling code, source control management, and performance testing. A demo, practice exercises, and a quiz are also included.

**Chapter 7: Application Deployment Strategies** - This chapter discusses recommended deployment strategies using appropriate tools, such as Anthos Configuration Manager, blue/green deployments, traffic-splitting deployment, rolling deployment scenarios, and canary deployments. Demos, practice exercises, and quizzes are provided to enhance your understanding.

**Chapter 8: Deploying Apps and Services** - This chapter explains deploying applications and services to Compute Engine and Serverless platforms on Google Cloud. It covers using service accounts, comparing compute options, deploying applications to Compute Engine and GKE, deploying applications using Cloud Build, deploying a Cloud Function, and deploying and managing APIs. Demos, practice exercises, and a quiz are included for hands-on learning.



**Chapter 9: Integrating Applications with GCP Services** - This chapter covers integrating an application with various Google Cloud services, such as Cloud SQL, integrating with a data store, publishing and consuming data asynchronously, selecting storage options, storing and retrieving data from Cloud Storage, and enabling and using Cloud APIs. Demos, practice exercises, and quizzes are included to cement your understanding.

**Chapter 10: Monitoring and Managing App Workloads** - This chapter teaches you about managing Compute Engine VMs and Serverless workloads. Topics cover creating a monitoring dashboard, monitoring and profiling a running application, exporting application logs and metrics, inspecting and monitoring resource utilization, writing and exporting custom metrics, and configuring workload autoscaling. Demos, practice exercises, and a quiz are included for practical learning.

**Chapter 11: Answers to Quizzes** - This final chapter provides answers and explanations for the quizzes in the various chapters so that you can learn from your mistakes and improve your chances of passing the exam.

## Code Bundle and Coloured Images

Please follow the link to download the *Code Bundle* and the *Coloured Images* of the book:

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# Table of Contents

<b>1. The Professional Cloud Developer</b> .....	<b>1</b>
Introduction .....	1
Structure .....	2
Objectives .....	3
Google Cloud Professional Cloud Developer certification exam .....	3
<i>Designing a study plan</i> .....	3
<i>Resources to help you prepare for the exam</i> .....	5
<i>Registering and scheduling the exam</i> .....	5
<i>Demos and practice exercises</i> .....	7
Conclusion.....	8
Further reading.....	8
<b>2. Development Environments</b> .....	<b>9</b>
Introduction .....	9
Structure .....	9
Objectives .....	9
Creating and managing Google Cloud projects .....	10
Overview of the Google Cloud Console .....	14
Understanding Cloud SDK.....	15
Cloud Code .....	16
Practice exercise - Create a bastion host.....	18
Exam tips .....	19
Conclusion.....	19
Key terms.....	19
Further reading.....	20
<b>3. GCP Products and Services</b> .....	<b>21</b>
Introduction .....	21
Structure .....	22
Objectives .....	23
Compute .....	23

---

Compute Engine.....	23
Kubernetes Engine .....	24
Serverless products and services .....	24
<i>Cloud Functions</i> .....	25
<i>Google Cloud Run</i> .....	25
<i>Storage</i> .....	27
Databases.....	28
Application integration .....	30
<i>Cloud Scheduler</i> .....	30
<i>API Gateway</i> .....	30
Networks .....	31
Operations.....	34
Continuous Integration/Continuous Delivery.....	35
Tools .....	38
Big data.....	38
<i>Artificial Intelligence</i> .....	41
Demo - Running an application on Google Cloud Run .....	42
Practice exercise - Examine the various GCP database offerings.....	46
Exam tips .....	46
Conclusion.....	47
Key terms.....	47
Quiz .....	48
Further reading.....	50
<b>4. Designing High-performance Applications.....</b>	<b>53</b>
Introduction .....	53
Structure .....	54
Objectives .....	54
IaaS, PaaS, FaaS and CaaS.....	54
Microservices for designing high-performance applications .....	56
Google Cloud Network.....	60
Regions.....	60
APIs and services .....	62
Demo - Creating a custom VPC .....	63

Practice exercise - Design a high-performance application for your company	65
Exam tips .....	66
Conclusion.....	66
Key terms.....	67
Quiz .....	67
Further reading.....	69
<b>5. Designing and Managing Secure Applications.....</b>	<b>71</b>
Introduction .....	71
Structure .....	71
Objectives .....	72
Secure applications.....	72
Secret Manager .....	73
Secret Management.....	73
IAM roles and permissions.....	74
Principle of least privilege .....	77
IAM conditions.....	78
<i>Authentication in the Google Cloud</i> .....	81
Information security .....	85
<i>Demo - Viewing audit logs</i> .....	86
Practice exercise - Create a new IAM role .....	88
Exam tips .....	89
Conclusion.....	89
Key terms.....	89
Quiz .....	89
Further reading.....	93
<b>6. Writing and Building Cloud-native Applications.....</b>	<b>95</b>
Introduction .....	95
Structure .....	96
Objectives .....	96
Modern application patterns.....	96
<i>Microservices</i> .....	97
<i>Containers</i> .....	97

---

<i>Serverless computing</i> .....	98
Debugging and profiling code .....	99
<i>Cloud Trace</i> .....	99
<i>Cloud Profiler</i> .....	100
<i>Cloud Debugger</i> .....	100
Source Control management.....	101
Performance testing.....	102
<i>Load testing</i> .....	102
<i>Stress testing</i> .....	102
<i>Volume testing</i> .....	102
<i>Performance testing tools</i> .....	103
<i>Apache JMeter</i> .....	103
<i>Apache Bench</i> .....	103
<i>WebLOAD</i> .....	103
<i>LoadRunner</i> .....	104
<i>Some of the challenges with performance testing</i> .....	104
<i>SLAs, SLOs and SLIs</i> .....	104
Demo - Build, deploy, and stress test a sample app.....	105
<i>Writing the sample app</i> .....	105
<i>Deploying the sample app</i> .....	110
<i>Stress testing the web server</i> .....	111
Practice exercise - Troubleshoot and prevent latency issues.....	113
Exam tips.....	113
Conclusion.....	113
Key terms.....	114
Quiz .....	114
Further reading.....	116
<b>7. Application Deployment Strategies .....</b>	<b>119</b>
Introduction .....	119
Structure .....	120
Objectives .....	120
Blue/green deployments .....	120

---

Traffic-splitting deployments .....	121
Canary deployments.....	123
Anthos Config Management .....	123
Demo - Deploy application onto a Google Kubernetes Cluster .....	124
<i>Creating the GKE Cluster</i> .....	124
<i>Kubectl</i> .....	127
<i>Kubernetes namespaces</i> .....	127
<i>Deploy and expose the application to GKE</i> .....	127
Practice exercise - Examine deployment strategies for HipLocal .....	129
Exam tips .....	129
Conclusion.....	130
Key terms.....	130
Quiz .....	131
Further reading.....	133
<b>8. Deploying Apps and Services.....</b>	<b>135</b>
Introduction .....	135
Structure .....	135
Objectives .....	136
Comparison of compute options.....	136
Google App Engine.....	137
<i>Benefits of App Engine</i> .....	138
Google Compute Engine.....	138
Google Kubernetes Engine: Kubernetes Engine.....	138
<i>Container Orchestration</i> .....	139
<i>Kubernetes Benefits</i> .....	139
Google Cloud Functions.....	139
<i>Triggers and Events</i> .....	140
<i>Realtime database triggers</i> .....	141
<i>Firebase authentication triggers</i> .....	141
<i>Google Analytics for Firebase triggers</i> .....	141
<i>Google Cloud Storage Events</i> .....	142
<i>Cloud Pub/Sub messages</i> .....	142
<i>HTTP requests</i> .....	142



---

Cloud Run .....	143
Deploying and Managing APIs.....	144
<i>GCP products and services used to deploy and run APIs</i> .....	144
<i>API Management &amp; Deployment with GCP</i> .....	145
<i>Apigee API Platform</i> .....	145
<i>API Gateway</i> .....	145
<i>Cloud Endpoints</i> .....	145
Demos: Application Deployments.....	145
<i>Deploy App Engine Application</i> .....	146
<i>Standard</i> .....	146
<i>Flexible</i> .....	146
<i>Some ways to get more from the flexible environment</i> .....	148
<i>Deploying LAMP on GCE</i> .....	149
<i>Create the Compute Engine Instance</i> .....	149
<i>Deploying Cloud Functions</i> .....	152
<i>Google Cloud Console</i> .....	153
<i>Testing the function</i> .....	155
<i>Deploying Cloud Run</i> .....	155
<i>Write a sample Go app</i> .....	156
<i>Containerise and upload the app</i> .....	157
<i>Deploy to Cloud Run</i> .....	158
Practice Exercise: Deploy Sample Webserver to GCE & GKE .....	158
Exam tips .....	159
Conclusion.....	159
Key terms.....	160
Quiz .....	160
Further reading.....	163
<b>9. Integrating Applications with GCP Services</b> .....	<b>165</b>
Introduction .....	165
Structure .....	165
Objectives .....	166
Pub/Sub.....	166
<i>Concept</i> .....	166

---

<i>Subscriptions</i> .....	167
<i>Transactions and retries</i> .....	168
<i>Dead letter queues</i> .....	168
<i>Message attributes</i> .....	169
<i>Integrating with Pub/Sub services</i> .....	169
<i>Creating a Pub/Sub topic</i> .....	169
<i>Setting up authentication for Pub/Sub access</i> .....	171
<i>Client Libraries</i> .....	171
<i>Google Cloud CLI</i> .....	172
<i>REST API</i> .....	172
<i>Securing and controlling messages</i> .....	173
<i>Identity and Access Management</i> .....	173
<i>Encryption</i> .....	173
<i>Audit Logging</i> .....	174
Database and storage services.....	174
<i>Database and storage options</i> .....	174
<i>Databases</i> .....	174
<i>Storage</i> .....	175
<i>Selecting storage options</i> .....	175
Store and retrieve data from cloud storage.....	178
Enabling and using Cloud APIs.....	179
<i>Enabling an API</i> .....	180
<i>Demo: Enable Cloud APIs for your applications</i> .....	182
Practice exercise: Integrate a demo application's services into GCP products and services.....	183
Exam tips.....	183
Conclusion.....	183
Key terms.....	184
Quiz.....	184
Further reading.....	187
<b>10. Monitoring and Managing App Workloads.....</b>	<b>189</b>
Introduction.....	189
Structure.....	190

---

Objectives .....	190
Configuring workload autoscaling.....	190
<i>App Engine</i> .....	190
<i>Configuring scaling settings</i> .....	192
Cloud Monitoring .....	193
<i>Metrics</i> .....	194
<i>System metrics</i> .....	194
<i>Custom metrics</i> .....	195
Inspecting and monitoring resource utilization .....	195
<i>Configure alerts in Cloud Monitoring</i> .....	196
Cloud Logging.....	197
<i>Cloud Logging features</i> .....	198
<i>Challenges in Log management</i> .....	199
<i>How Cloud Logging works</i> .....	199
<i>Using Cloud functions to process logs</i> .....	200
<i>Types of logs that can be managed</i> .....	200
<i>Best practices for log management</i> .....	202
<i>Creating log-based metrics</i> .....	203
Demo - Set up a monitoring dashboard.....	204
<i>Send custom metrics to monitoring dashboard</i> .....	206
Practice exercise - Add key performance indicators to monitoring dashboard .....	207
Exam tips .....	207
Conclusion.....	208
Key terms.....	208
Quiz .....	208
Further reading.....	210
<b>11. Answers to Quizzes.....</b>	<b>211</b>
Introduction .....	211
Structure .....	211
Objectives .....	211
Chapter 3 - GCP Products and Services.....	212
<i>Question 1</i> .....	212

---

Question 2.....	212
Question 3.....	212
Question 4.....	212
Question 5.....	212
Question 6.....	213
Question 7.....	213
Question 8.....	213
Question 9.....	213
Question 10.....	214
Chapter 4 - Designing High-performance Applications .....	214
Question 1.....	214
Question 2.....	214
Question 3.....	214
Question 4.....	215
Question 5.....	215
Question 6.....	215
Question 7.....	216
Question 8.....	216
Question 9.....	216
Question 10.....	216
Chapter 5 - Designing and Managing Secure Applications.....	217
Question 1.....	217
Question 2.....	217
Question 3.....	217
Question 4.....	217
Question 5.....	217
Question 6.....	218
Question 7.....	218
Question 8.....	218
Question 9.....	219
Chapter 6 - Writing and Building Cloud-native Applications.....	219
Question 1.....	219

---

Question 2.....	220
Question 3.....	220
Question 4.....	221
Question 5.....	221
Question 6.....	221
Question 7.....	222
Question 8.....	222
Chapter 7 - Application Deployment Strategies.....	223
Question 1.....	223
Question 2.....	223
Question 3.....	223
Question 4.....	224
Question 5.....	224
Question 6.....	224
Question 7.....	225
Question 8.....	225
Chapter 8 - Deploying Apps and Services.....	225
Question 1.....	225
Question 2.....	226
Question 3.....	226
Question 4.....	227
Question 5.....	227
Question 6.....	227
Question 7.....	228
Question 8.....	228
Chapter 9 - Integrating Applications with GCP Services.....	228
Question 1.....	228
Question 2.....	229
Question 3.....	229
Question 4.....	229
Question 5.....	230
Question 6.....	230

Chapter 10 - Monitoring and Managing App Workloads .....	231
<i>Question 1</i> .....	231
<i>Question 2</i> .....	231
<i>Question 3</i> .....	231
<i>Question 4</i> .....	231
<i>Question 5</i> .....	232
Conclusion.....	232
<b>Index .....</b>	<b>233-239</b>

# CHAPTER 1

# The Professional Cloud Developer

## Introduction

Modern businesses adopt the cloud and move some of their infrastructures to providers such as AWS, Microsoft Azure, and Google Cloud. According to the Flexera 2021 State of the Cloud Report, AWS is currently the leader in providing cloud computing services, followed by Azure, with Google Cloud gaining numbers close to both. GCP is an attractive alternative to AWS and Microsoft Azure with an intuitive interface, lower costs, preemptible instances, and flexible add options. Please refer to the following figure:

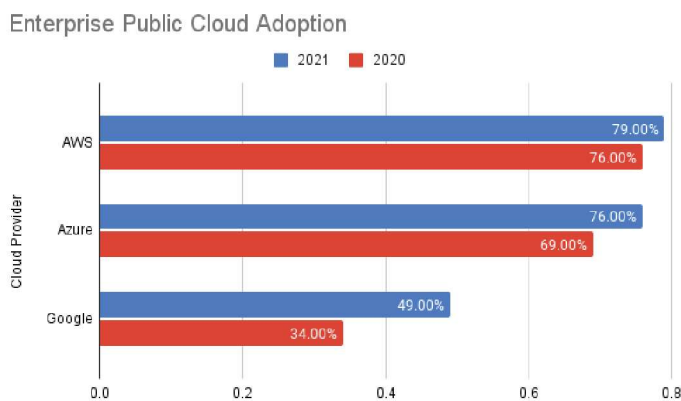


Figure 1.1: Enterprise public cloud adoption (Source: Flexera 2021 State of the Cloud Report)

As many enterprises continue to embrace the cloud, the demand for professionals who can build applications ready for the cloud increases. The Professional Cloud Developer helps develop highly scalable applications using best practices to the cloud. Please refer to the following figure:

Enterprise Public Cloud Spend

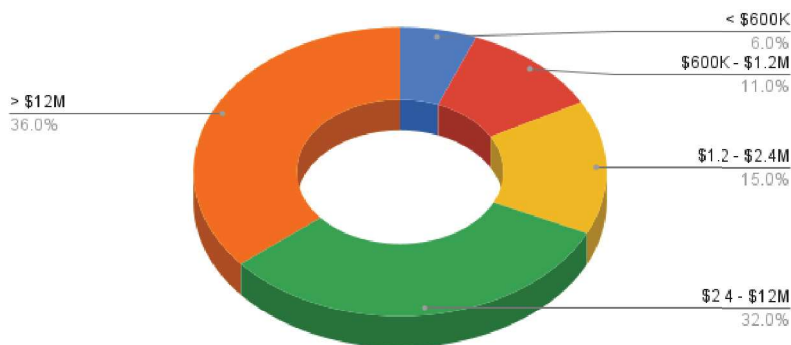


Figure 1.2: Enterprise public spend (Source: Flexera 2021 State of the Cloud Report)

Becoming a Google Certified Professional Cloud Developer validates your skills for building, deploying and managing highly available cloud-native applications. A professional cloud developer:

- Builds cloud-native applications using microservices
- Understands how to use Google Cloud managed services
- Knows how to secure applications built for the cloud
- Knows how to test and scale applications in the cloud
- Has proficiency in at least one general programming language
- Deploys applications that integrate with Google Cloud services
- Can manage application performance
- Understands and knows when to implement encryption at rest, in transit and use

## Structure

In this chapter, we will discuss the following topics:

- Google Cloud Professional Cloud Developer certification exam



- Designing a study plan
- Resources to help prepare for the exam
- Registering and scheduling the exam

## Objectives

In this chapter, we shall look at the Professional Cloud Developer, what they do and their expected experience. We shall quickly overview the entire exam, expectations, and requirements. We will have a high-level understanding of the technical requirements to take the exam.

## Google Cloud Professional Cloud Developer certification exam

Even though there are no prerequisites for the exam, Google recommends you have more than three years of industry experience, including designing and managing solutions using GCP.

For those without the recommended years of experience building on GCP, the book has been designed to help you gain some hands-on experience, demos and exercises to help you grasp foundational to advanced concepts.

The best way to learn and have experience is to build actual projects running on the Google Cloud. We will sign up for trial credits on GCP and build demo projects that we can refer back to occasionally through guided demos. Our demo GCP project will have applications deployed to Compute Engine and various Serverless offerings.

It is important to note that even with hands-on experience, preparation for the exam is essential. Google Cloud is constantly innovating and adding more products. We shall cover foundational concepts for designing, building and deploying secure and highly scalable cloud-native solutions in our practice.

In the exam, you have 2 hours to answer about 60 questions. Read the exam overview information, including the exam guide and case study.

The exam is currently offered in English and Japanese and can be taken remotely or at a testing centre. Once you finish the exam, you only receive a Pass or Fail with no score and details.

## Designing a study plan

Depending on the years of experience, it can take between 3 to 9 weeks to prepare for the exam. This book has practice exams that can help you familiarize yourself

with the exam format and type of questions to expect. As you prepare for the exam, avoid and stay away from exam dumps as much as possible.

You can create a study plan based on the following steps:

1. Review the Professional Cloud Developer Exam Guide by Google. The guide can be found at this web page <https://cloud.google.com/certification/guides/cloud-developer>.
2. Review the Professional Cloud Developer sample questions to get a feel of the format, the exam questions and example content that may be covered. Getting all correct here does not guarantee you are ready for the exam. Make a note of the areas you need to improve and add to your study plan.
3. Sign up for Qwiklabs by Google to claim 30 days free access to complete skills challenge and lab quests. Qwiklabs can help you acquire experience on the live Google Cloud Platform with guided instructions.
4. Get started for free on Google Cloud by visiting <https://cloud.google.com>. You will use this to implement some of the demos in the book. Signing up for the first time gives you \$300 of free Cloud Billing credits to explore and learn. You can also use this for actual live projects if you choose to. You can use the credit for multiple projects if linked to the same billing account. Create a demo project for a demo infrastructure which we will set up in this book.
5. Complete chapters 2-12 of this book. At the end of each chapter, implement the demos and practice exercises. They are designed to test your understanding of the chapter. You will have to implement the demos on your GCP project so you can keep going back to it for reference.
6. Practice the complimentary mock exams in chapters 13 and 14. Each mock exam covers the techniques used to answer the questions. Note down the areas you need to improve as you practice the exams.
7. At this point, you should have a dedicated note of the areas you need improvement on. Focus on these areas in the chapters and then try your hands on the mock exams once more. Repeat steps 6 and 7 till you feel very comfortable and ready. You can tell you are ready when you are averaging 80%. Google only notifies you if you have passed or failed with no pass mark, so you must aim for a high score.
8. Schedule the exam. Now, this can be done earlier so you do not procrastinate, otherwise, at this point, you should feel confident enough to write the exam once you are done with your study plan.