

Google Professional Cloud Developer Exam Guide

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

Fiifi Baidoo



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Dedicated to

My mother:

Dr. Ama Beduwa Maison

&

My daughter:

Beduwa Baidoo

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Fiifi Baidoo, with more than two decades of professional experience in software development, cloud infrastructure design, and operational roles, is a Cloud Certified Professional with deep expertise in cloud computing.

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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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Acknowledgement

Writing **The Google Professional Cloud Developer Exam Guide** has been an enlightening journey, one that would not have been possible without the help of numerous individuals and resources. I am deeply grateful to everyone who has contributed their time, energy, and expertise to this project.

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Finally, I owe a debt of gratitude to my family, friends, and colleagues at CLOUDPORT, who have supported me throughout this journey. The encouragement, patience, and understanding of my partner at Bloombio have not gone unnoticed or unappreciated. You have been my rock, sounding board, and cheerleader; for that, I am forever thankful.

"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:

<https://rebrand.ly/7rvi5ys>

The code bundle for the book is also hosted on GitHub at **<https://github.com/bpbpublications/Google-Professional-Cloud-Developer-Exam-Guide>**. In case there's an update to the code, it will be updated on the existing GitHub repository.

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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:

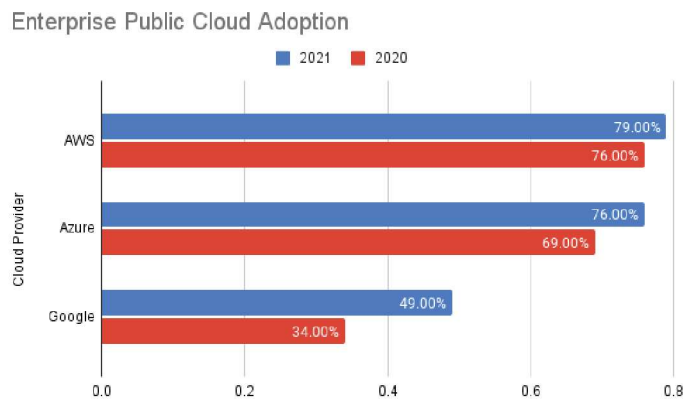


Figure 1.1: Enterprise public cloud adoption (Source: Flexera 2021 State of the Cloud Report)

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

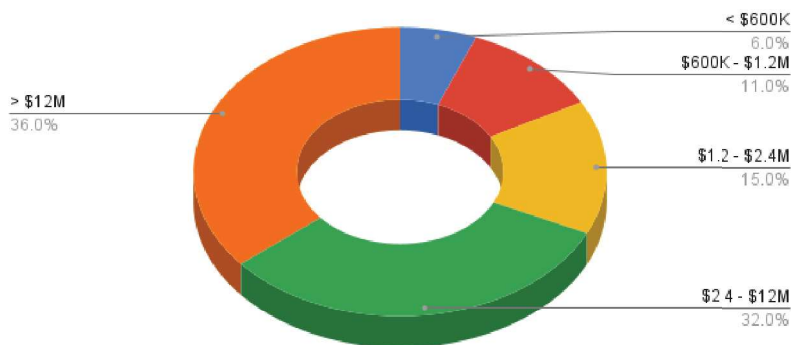


Figure 1.2: Enterprise public spend (Source: Flexera 2021 State of the Cloud Report)

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.