CompTIA Cloud+ Certification Guide (Exam CV0-003)

Everything you need to know to pass the CompTIA Cloud+ CV0-003 exam

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Dedicated to

The light of my life, ***Padma***

&

Apple of my eye, ***Dheeraj***

About the Author

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Preface

Cloud computing plays a crucial role in today's world across various sectors and industries. Imagine a cloud as a vast network of remote servers connected through the internet, where you can store, manage, and access data and applications instead of relying solely on your local computer or device. Such a system offers innumerable benefits to enterprises. Starting from accessibility to scalability, cost savings, collaboration, productivity gains, security, data backup and recovery and innovation, the benefits are simply too many to ignore. Consequently, cloud computing is fast becoming a default approach for enterprise computing. This necessitated skilled workforce that can understand the different flavors of cloud computing with sufficient knowledge of the concepts to help enterprises plan and implement their cloud strategy. It is crucial to be able to differentiate workforce possessing the knowledge and skills to enable an organisation's cloud journey. CompTIA has introduced Cloud+ certification for this purpose and is now in the iteration 3 of this certification.

This book aims to guide and provide a comprehensive reference to readers in their journey to achieving the CV0-003 certification exam. The topics are carefully covered to provide an in-depth discussion on all the topics that can be expected in the exam. The chapters are designed to match the topics that are covered by CV0-003 exam, which are up-to-date skills needed in the market.

Chapter 1: Introduction to CV0-003 Exam - introduces the examination, pattern of questions and provides complete details of the information needed to take the exam. By the end of this chapter, you shall be in a position to decide if CV0-003 exam is apt for you, how to approach the book and how to prepare for the exam.

Chapter 2: Overview of Cloud Computing- covers the topics of cloud computing right from the basics. Starting with a brief intro to the history of cloud computing, this chapter covers cloud service offerings, delivery models and common cloud jargon.

Chapter 3: Managing Virtual Machines- provides a comprehensive discussion of virtual machines. It covers the technology of virtualization, its inner workings, advantages, types, and why it is crucial to cloud computing.

Chapter 4: Managing Storage- discusses everything about storage, starting with the traditional storage mechanisms to advanced aspects like NAS, SAN, this chapter discusses all cloud storage topics like object storage, replication and disaster recovery.

Chapter 5: Networking Fundamentals- covers all the fundamental aspects of networking. These fundamentals originated with traditional data centers and have evolved to the cloud and are important even today. This chapter covers OSI 7 layer architecture, 4 layer IP architecture, introduces various network topologies and networking components.

Chapter 6: Managing Networks- expands on the previous chapter. It delves into a significant details of IPv4 and IPv6 and discusses various protocols used over the internet. State of the art topics like network virtualization, address translations, Software Defined Networking are covered in complete detail.

Chapter 7: Managing Security- discusses security aspects of computing. IT discusses the approaches to IT security, cryptography and encryption and discussed the network security threats that are common in the IT industry. It also discusses the common approaches for protecting against such threats and discusses the security implementations that are common to cloud computing. This chapter also serves as a basic introduction to CCSP certification exam.

Chapter 8: Identity and Access Management- introduces the concepts of Identity management, authentication, various approaches for authorization and access control. The state of the art approaches like SAML, OAuth, OpenID are discussed in this chapter.

Chapter 9: Migrating to Cloud- puts all the topics together. This chapter discusses how a traditional IT system can be migrated to a cloud and the different migration strategies available for accomplishing this. This chapter also explains the life cycle of a migration project and discusses how to prepare a roadmap for enterprise application migration.

Chapter 10: Orchestrating Cloud Applications – This chapter discusses the administrative and development aspects of a cloud. The topics of Automation, Orchestration and their relationship are discussed in detail. Latest topics like Infrastructure as Code, runbooks and runbook automation are covered in detail.

Chapter 11: Troubleshooting in Cloud- discusses CompTIA's Troubleshooting Methodology. It also discusses how to troubleshoot problems that occur in cloud

applications. It discusses the tools and approaches available for developers and cloud administrators for troubleshooting applications. It also discusses the best practices for cloud application development.

Chapter 12: Disaster Recovery and High Availability- This chapter discusses the disaster scenarios that can impact a cloud application, the need for business continuity and the methods for withstanding and recovering from disasters. Various metrics to be used for measuring the effectiveness of disaster recovery, approaches for backup and the facilities available in cloud for high availability are discussed.

Chapter 13: Public Cloud Services- This chapter provides some information on the various cloud service offerings provided by the major cloud service providers. This chapter is auxiliary information to provide additional information to readers.

Chapter 14: Practice Questions- provides a set of questions that are not found elsewhere on the internet. These Q&A provide a simulation of the examination and give the reader with a mock examination experience.

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Chapter 1
Introduction to CV0-003 Exam

Introduction

The purpose of this chapter is to introduce the CompTIA® Cloud+ certification examination to readers. This chapter covers the purpose of the examination, who can attempt the exam, how to register for it, and what is expected from those who clear the examination. It also provides guidance on how to approach this book and how to prepare for the examination.

Structure

The following topics are covered in this chapter:

- About CompTIA
- About CV0-003 exam
- Who should take this exam?
- About this book
- Exam Readiness Checklist

About CompTIA®

The **Computing Technology Industry Association (CompTIA)** is a leading vendor-neutral, independent source of information, education, training, and certification for the global IT workforce. They offer training and certifications on emerging technologies. Their membership and certification holders span the range of technology companies from established Fortune 500 leaders to small- and medium-sized tech businesses. By remaining vendor neutral, their certifications aim to evaluate the test takes on the concepts that are relevant to the industry without being confined to a single vendor.

About CV0-003 exam

CompTIA's Cloud+ is a global certification that validates the skills needed to deploy and automate secure cloud environments that support the high availability of business systems and data. It is a performance-based IT certification that views cloud-based infrastructure services in the context of broader IT systems operations, regardless of the platform. CompTIA Cloud+ validates the technical skills needed to deploy, optimize, and protect mission critical applications and data storage.

There are no prerequisites for attempting the examination. CompTIA recommends a total of 5 years of IT experience, including 2-3 years of networking or systems administration experience, but it is not mandatory. The exam itself contains 90 questions that are mostly multiple-choice questions. A few performance-based questions are also included where the candidate should understand a given exhibit and answer questions based on that. In the 90-minute test, the candidate should score 750 marks out of 900. Being a vendor-neutral examination, the questions will not be specific to any cloud vendor.

From the date of acquiring, the certificate is valid for 3 years. After this period, candidates can renew their certificate by following the CompTIA's Continuing Education program. Candidates can renew their certification by collecting and reporting 50 Continuing Education Units within 3 years.

The Cloud+ certification examination is continuously updated by CompTIA to ensure that it meets the latest industry requirements. CV0-003 is the latest version of the Cloud+ certification. It includes questions across five domains, which are listed in the following table:

Domain	Examination questions
Cloud Architecture & Design	13%
Security	20%
Deployment	23%

Operations & Support	22%
Troubleshooting	22%

Table 1.1: *Distribution of questions in CV0-003 exam*

Compared to CV0-002, the latest exam dropped the topic of Systems Administration and included the topics of High-availability, Automation and virtualization content, and Cloud architecture.

Who should take this exam?

CompTIA Cloud+ is ideal for cloud engineers who need to have expertise across multiple products and systems. As per CompTIA, the following job roles are primary and secondary beneficiaries of obtaining a Cloud+ certification. This content is taken as is from CompTIA's website at **https://www.comptia.org/blog/the-new-comptia-cloud-your-questions-answered**.

Primary Job Roles for CompTIA Cloud+ CV0-003

- **Senior systems administrator**: A cloud systems administrator develops, maintains, and troubleshoots the network connections of cloud computing resources.
- **Systems engineer**: Systems engineers monitor and manage hardware and software, and provide guidance when needed to their team to keep everything running smoothly.
- **Cloud engineer**: A cloud engineer is responsible for maintaining the cloud so that it addresses the business's needs fully and accurately.

Secondary Job Roles for CompTIA Cloud+ CV0-003

- **Senior network administrator**: A network administrator supports the company's internal servers in installing and maintaining network and hardware systems.
- **Senior network engineer**: Network engineers are responsible for building and designing communication networks. They are also called network architects.
- **Cloud specialist**: Cloud specialists help organizations migrate their information and services to the cloud.
- **Cloud project manager**: Project managers set timelines for projects and keep the group in scope and on budget.

Anyone wanting to showcase their knowledge of the cloud computing concepts and targeting the mentioned roles can attempt the exam and benefit from it.

About this book

This book is meant as a comprehensive guide for all information needed to successfully complete the CV0-003 examination. The book does not assume any prior knowledge of cloud computing. However, a basic knowledge of IT industry and the way of working of IT professionals is assumed.

Exam readiness checklist

Test takers are recommended to read the book thoroughly before scheduling the examination. Questions provided at the end of every chapter should be thoroughly practiced. Of particular importance is Chapter 14, which is a mock practice examination. It is highly recommended for candidates to practice the examinations in a timed manner and test their knowledge against the answer key provided. It is suggested to aim for a 90% correctness in these mock tests before appearing for the CV0-003 examination. Once you are confident of your scores, you should visit **www.comptia.org** and schedule your examination as per instructions on CompTIA's website. Refer to the following table:

S. No	Item	Completed Yes/No
1	Practice questions at the end of every chapter	Yes
2	Mock tests in chapter 14	Yes
3	Timed mock tests in chapter 14 with 90% correct answers	Yes

Table 1.2: *Exam readiness checklist*

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Chapter 2
Overview of Cloud Computing

Introduction

This chapter shall provide an introduction to the concept of the cloud. We will look at how the idea of virtual machines started from the earliest days of computing, that is, the MULTICS Operating System, Unix. We will discuss how innovations in networking and computing have made computing ubiquitous and affordable to all. We will also briefly discuss the economic drivers, such as economies of scale and Capex/Opex considerations, that have driven cloud adoption in the enterprise.

Moving on, we will discuss the basic terminology of Cloud Computing. An eagle's eye view of cloud-based application development will highlight the salient differences between traditional application development (that is, standalone/desktop applications) and cloud-based applications.

Structure

We will look at the following topics in this chapter:

- History of cloud computing
- Innovations in networking
- Innovations in computing

- Cloud service offerings
    - Software as a Service (SaaS)
    - Platform as a Service (PaaS)
    - Infrastructure as a Service (IaaS)
    - Desktop as a Service (DaaS)
    - Anything as a Service (XaaS)
- Cloud Delivery Models
    - Private Cloud
    - Public Cloud
    - Hybrid Cloud
    - Community Cloud
- Common Cloud Jargon
- Cloud developer beginner questions

History of cloud computing

The earliest computers were costly machines and very slow in computing speed. As the computing power of the systems increased, it was observed that all programs do not utilize the entire CPU. The concept of time-sharing emerged in the 1960s, with the idea of using the idle time of CPUs and improving the cost-efficiency of computing. Improvements in hardware and software algorithms have allowed enterprises to rent out their computing power to third-parties and monetize the idle time of their systems. This gradually became a business model where large organizations procured expensive computing power, and third parties used and paid for it "on-demand."

Salesforce pioneered the revolution when it released its enterprise software as a subscription model known as SaaS. Amazon started offering storage and virtual machines over the internet and revolutionized the computing world with its IaaS model. Google offered a PaaS offering named Google App Engine, which provided a platform for application development over the internet. Coupled with significant hardware advances like hypervisors, hardware-assisted virtualization, and software innovations like Docker containers, software-defined networking, and so on, cloud computing redefined the software development paradigm and became the next big "it" thing.