

Chapter 1

Essential Concepts in Cloud Computing

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ABSTRACT

This chapter offers an in-depth review of the revolutionary development of cloud computing, from its theoretical underpinnings to its current position as a vital component of modern infrastructure for information technology. The historical trends, significant turning points, and technological advancements in the discipline are reviewed in this chapter. It explores the beginnings of cloud computing, how service models have changed over time, the effects of virtualization, and how new technologies are being incorporated. Readers will gain a profound appreciation for how cloud computing has transformed the operations and innovation of organizations by comprehending the historical background and recent developments.

INTRODUCTION TO CLOUD COMPUTING

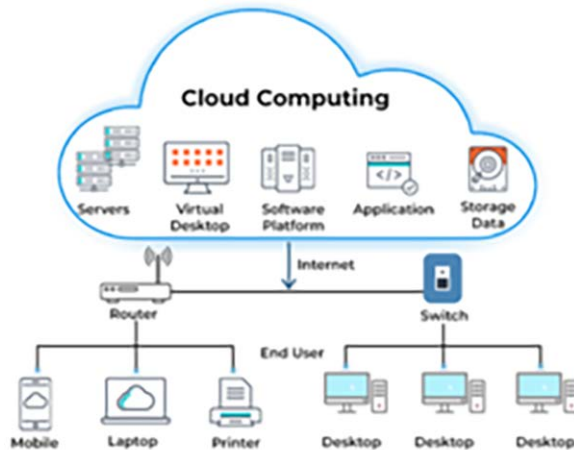
By understanding these fundamental concepts, readers can grasp the essentials of cloud computing and its potential to transform their business or personal computing experiences. Several concepts and definitions can aid our understanding of cloud computing. The key concepts include the basic definition of cloud computing, service models, deployment models, essential characteristics, and future cloud computing evolution, so this chapter discusses all the mentioned topics and discusses the root

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of cloud computing. The two primary justifications for using cloud computing CC are dependability and convenience. Cloud services are delivered via the Internet, so privacy and security must be the priority (Shahab Shamshirband et. Al. 2020). The main characteristics of Cloud Computing are categorized by the following elements:

- On-demand self-service: Consumers can automatically request the service based on their needs, without interacting with the service provider.
- Easy-to-access standardized mechanisms: Access to the service should always be possible from the Internet when policies permit.
- Resource pooling and multi-tenancy: sharing resources among multiple tenants can increase utilization and reduce operational costs.
- Rapid elasticity: the ability to scale resources in and out provides flexibility to provision resources on demand.
- Measured service: monitoring service conditions and measuring them enables resource optimisation.
- Auditability and certifiability: services should provide logs and trails that allow the traceability of policies to ensure their correct application is enforced (Radošević & Hongyu Pei-Breivold, 2014). Figure 1 shows the visual representation of Cloud Computing.

Figure 1. Cloud Computing Visual (<https://www.spiceworks.com/tech/cloud/articles/what-is-cloud-computing/>)



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