

Chapter 2

Cloud Computing Architecture:

Investigating the Complex Details of Cloud Computing Architecture

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ABSTRACT

The cloud computing era is currently in the IT industry. With its Internet-based foundation, cloud computing boasts the most potent processing architecture. Hardware, software, and internet infrastructure are all interconnected and integrated to form this system. It offers several advantages over grid computing and other computing systems. Cloud computing architecture is a fundamental framework that enables the delivery of various computing services over the Internet. This architecture comprises a front-end platform, back-end platforms, a cloud-based delivery model, and the network infrastructure that connects these components. The architecture is designed to provide scalable, flexible, and cost-effective solutions for a wide range of applications, from data storage and processing to software development and deployment. This chapter investigates the intricate details of cloud computing architecture, exploring its components

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1. INTRODUCTION

To reach the essence of cloud computing we must revisit the following concept of cloud computing. The National Institute of Standards and Technology (NIST) has proposed the most widely accepted definition of cloud computing. The NIST defines Cloud computing as a distributed computing architecture that concentrates server resources on a scalable platform, delivering computing resources and services as needed, anytime and anywhere (Mell & Grance, 2011). Cloud computing builds increasing cost trends for driving the cost out of the delivery of services while increasing the speed and agility with which services are deployed. It shortens the time from sketching out an application architecture to actual deployment. Cloud computing incorporates virtualization, on-demand deployment, Internet delivery of services, and open-source software. From one perspective, cloud computing is nothing new because it uses approaches, concepts, and best practices that have already been established. From another perspective, everything is new because cloud computing changes how we invent, develop, deploy, scale, update, maintain, and pay for applications and the infrastructure on which they run. This chapter examines the trend of cloud computing architecture, cloud-based delivery models, and network infrastructure (Nanda Banger et al., 2022).

Cloud computing architecture implies a significant change in how businesses deploy and operate apps and services. Makes it possible to distribute computer services—such as servers, storage, databases, networking, software, and analytics—through the Internet, providing economies of scale, flexible resources, and quicker innovation. Through an examination of its components, deployment strategies, and best practices for maximizing security and performance, this chapter dives into the finer points of cloud computing architecture. All types of organizations use cloud computing systems to store data in the cloud, allowing them to access their systems at any time. Cloud computing architecture is divided into two parts: the Front End and the Back End. Both parts are connected through the Internet. There are many ways to describe cloud architecture, but the best way to conceptualize a cloud is through its various layers. Figure 1 shows the basic architecture of cloud computing (Pallis, 2010).

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