Computer Architecture and Characteristics of Software Cloud Computing

K. Srinivas[1], A. Appa Rao[2]

Rayalaseema University, Kurnool, AP, India

Abstract: *The concept of Cloud computing has been around for over a decade and is increasingly becoming an important part of contemporary techno-world. Some scholars and researchers are even referring to cloud computing as a novel model and an emerging technology that openly offers IT resources and services over the web. The most important feature of Cloud computing is that it offers tremendous amount of power for not only computing but also storage while also providing enhanced scalability and flexibility. In this paper we describe computer architecture and characteristics of software cloud computing.*

Keywords: Cloud Computing, Architecture, Characteristics, Software benefits

1. Introduction

Advances in the field of IT and the introduction of computers have been considered a major turning point in the history of humankind. It has led to a wide range of changes across fields. It has led to enhanced skill, productivity and superior quality output in every field. Similarly, Information technology has also experienced a rapid growth in terms of processing and storage technologies. Along with other developments, this has led to the invention of an innovative technology or more specifically, a computing model called cloud computing (Avram, 2014).

2. Cloud Computing

The concept of Cloud computing has been around for over a decade and is increasingly becoming an important part of contemporary techno-world. Some scholars and researchers are even referring to cloud computing as a novel model and an emerging technology that openly offers IT resources and services over the web (Fenn et al. 2008). However, one of the earliest definition of Cloud computing was provided by Youseff et al. and they attempted to provide a comprehensive definition of cloud computing and all its relevant elements. They viewed cloud computing as a collection of numerous old and some new ideas in a few research fields like Service-Oriented Architectures (SOA), distributed and grid computing as well as Virtualization (Youseff et al. 2008). As indicated by Youseff et al. (2008) cloud computing can be viewed as another computing prototype that enables clients to briefly use computing infrastructure over the network system that is provided as a service by the cloud-provider at conceivably at least one level of abstraction, if not more.

3. Architecture for Cloud Computing

In order to understand the concept of Cloud computing better, it is essential to discuss the architecture for cloud computing. In this section, adapting from previous studies, a brief explanation of the cloud computing architecture is provided. With the rise in the use of the term 'Cloud Computing' numerous organizations as well as independent researchers have attempted to define the architecture for Cloud Computing. Fundamentally, the entire system can be sectioned into the core stack and the management. The core stack has three layers:

- Resource is the infrastructure layer that is comprised of physical as well as virtualized computing, storage and networking resources.
- Platform is considered the most complicated part, which could be further divided into several sub-layers; for instance, a computing framework administers the transaction dispatching and/ or task scheduling. The storage sub-layer offers limitless storage and caching capability.
- Application server along with other components support similar general application logic as with either on-demand capability or flexible management, so that none of the components are the bottle neck of the entire system. On the basis of the principal resource and components, the application can support big and distributed transactions and manage enormous volumes of data (Qian et al., 2009).

All the layers offer external service across web services or other open interfaces. The following figure effectively illustrates Cloud architecture.
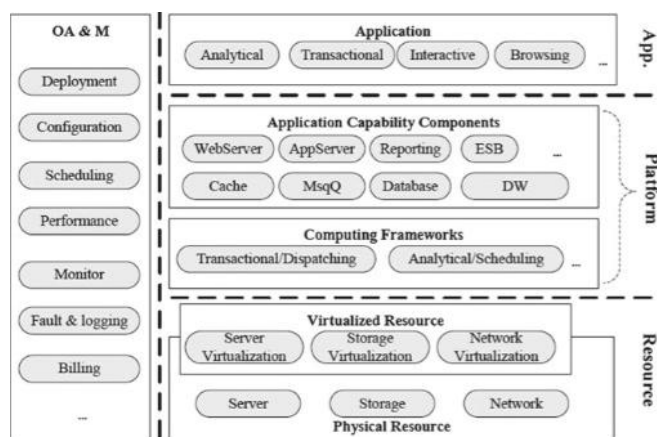

Figure 1: Cloud Architecture (Shawish & Salama, 2014)

The study provides a comprehensive overview of tracing the evolution of MDSS from system with machine learning to the present day intelligent system. Understanding the developments in the field provides scholars, educators and medical professionals with information necessary to

understand the modern MDSS and also creates scope for further developments and research. The current study contributed to previous research in the areas of information technology, decision support systems, medical informatics, and medical decision support systems.

The discussion in the study not only provides insight into the development of MDSS but also attempts to fill the gap that exists in the body of knowledge and literature. The study will enable medical practitioners to understand the concept of MDSS and its significance in the healthcare system especially relating to patient care and management. Improvements in MDSS can also help detect illnesses, foresee conditions, and help both doctors and patients to anticipate medical conditions among other things. The discussion in this study can be used to further investigate MDSS and its role in healthcare sector and its drug discovery process.

4. Characteristics of Cloud Computing

The most important feature of Cloud computing is that it offers tremendous amount of power for not only computing but also storage while also providing enhanced scalability and flexibility. Based on previous studies there are some characteristics of cloud computing that stand out and are discussed briefly below (Wang et al. 2008):

- On-demand service: Computing Clouds offer resources, assets and services to clients as per their demand. Clients can modify and customize their computing environment later, for instance, software installation as clients typically have the administrative privileges.
- QoS guaranteed offer: The computing environment given by computing Clouds can ensure QoS for clients, for example, hardware performance like CPU speed and size of the memory. The computing Cloud adjusts QoS by and large by handling Service Level Agreement (SLA) with clients.
- Autonomous System: The computing Cloud is a self-governing system and it is overseen transparently to clients. Hardware, software and data within the Clouds can be automatically reconfigured, arranged and merged to show a single platform image, ultimately rendered to clients.
- Scalability: The scalability and flexibility are the most critical elements that drive the development of the Cloud Computing. Cloud services and computing platforms given by computing Clouds could be scaled through different concerns, for example, topographical areas, hardware performance etc. The platforms for computing ought to be adaptable to adjust to different necessities of a large number of clients.

There are other significant characteristics of Cloud Computing like TCP/IP based, virtualization and high security. TCP/IP offers trustworthy delivery, a connection-oriented service among remote applications.

5. Summary

There are other significant characteristics of Cloud Computing like TCP/IP based, virtualization and high security. TCP/IP offers trustworthy delivery, a connection-oriented service among remote applications. The most important feature of Cloud computing is that it offers tremendous amount of power for not only computing but also storage while also providing enhanced scalability and flexibility.

References

[1] Avram, M. G. (2014). Advantages and challenges of adopting cloud computing from an enterprise perspective. Procedia Technology, 12, 529-534.

[2] Fenn J. (1995) 'When to Leap on the Hype Cycle' Gartner Group, January, 1995

[3] Shawish, A., & Salama, M. (2014). Cloud computing: paradigms and technologies. In Inter-cooperative collective intelligence: Techniques and applications (pp. 39-67). Springer Berlin Heidelberg.

[4] Youseff, L., Butrico, M., & Da Silva, D. (2008, November). Toward a unified ontology of cloud computing. In Grid Computing Environments Workshop, 2008. GCE'08 (pp. 1-10). IEEE.

[5] Qian,L.,Luo,Z., Du,Y., Guo,L. (2009). Cloud computing: An overview, in Proceedings of 1st International Conference on Cloud Computing, pp. 626–631

[6] Wang, L., Tao, J., Kunze, M., Castellanos, A. C., Kramer, D., & Karl, W. (2008, September). Scientific cloud computing: Early definition and experience. In High Performance Computing and Communications, 2008. HPCC'08. 10th IEEE International Conference on (pp. 825-830). Ieee.