

A Generalized Approach on Cloud Computing

T. Prasath¹ J. Paul Richardson Gnanaraj² K. Sankar Ganesh³
^{1, 2, 3}Assistant Professor ^{1, 2, 3}Kingston Engineering College, Vellore

Abstract--- Cloud computing is recognized as one of the most emerging technology in recent times. Cloud computing is a model for on-demand network access in a convenient manner to share pool of configurable computing resources that can be rapidly checked and released with service provider interaction. It is a combination of computation, software, data access and also provides storage services. Data storage and the location of stored data are not known to the user in cloud. The cloud has more advantages and it is easy to implement with any business logics. To explore different areas of cloud computing considerable amount of research has been carried out. This paper, presents you an overview on cloud computing with its characteristics for a better vision towards cloud computing.

Keywords: Cloud Computing, Distributed Computing, Cloud Services.

I. INTRODUCTION

Cloud Computing is evolved from Grid Computing. They share lot of common features like vision, architecture and technology, but also differ in the various aspects like security, programming model and applications. Grid Computing and Cloud Computing are used to reduce the cost of computing, increase reliability, and flexibility. Due to the increase in demand for large computing, analyzing of massive data leads to the migration of Grid Computing to Cloud Computing. The main reason for this shift is to reduce the cost of building multiple systems and enabling security to each system.

Cloud computing is an “on demand resources provisioning”, which means to provide the available resources based on the requirement of the resources. Cloud computing is an emerged computing model that uses multiple remote servers to maintain data and software applications. It addresses the next evolutionary step of distributed computing using computer commodity clusters. The goal of cloud computing is to achieve higher throughput, scalability, inexpensive on-demand computing infrastructures with good quality of service levels and able to tackle large scale computation problem by making better use of distributed resources. Cloud computing is a “subscription based” pay as per usage and reliable network which leads to an efficient network usage. Cloud Computing is successful computing model because of the following features like reliable, secure, fast, fault tolerance and efficient communication etc., among different network.

In 1980s, from the costly and complex information technology solutions and enterprises application Cloud technology has been evolved. Later with the recent expansion of internet in 1990s the technology is enabled along with the dramatic drop in the bandwidth costs and

other technological advances have contributed to the emergence of cloud computing. Cloud computing allows multi-user-real-time access which provides tangible and measurable benefits when compared to earlier Application Service Providers. Multitude of business applications and processes are carried out today with the diversity of cloud computing architecture and complexity. In cloud computing the virtualized resources are provided as a service over internet in dynamically scalable style of computing. Users need not have knowledge of, control over the technology infrastructure "in the cloud" that supports them.

Cloud computing brings several benefits to the users, some of which are as follows:

- 1) Huge range of applications can be accessed without download and installing anything.
- 2) Fault tolerance – system automatically alert failover and re-sync back to the “last know state” as if anything is failed.
- 3) Interoperability to vendor services in different platforms.
- 4) Dynamic resource sharing
- 5) Efficient load balancing and scalability
- 6) Users can access the information or application from any point of the world.
- 7) Cost efficient since users can pay only to their needs.

II. CLOUD SERVICES

Cloud Service vendors provides the cloud services based on the demand of users. Cloud services are offered at different layers of the resource stack. The cloud services are collectively referred as Cloud Service Models. Cloud service models are Service Oriented Architecture, which describes the cloud services in different levels of abstraction.

The three classified services of cloud computing is as follows: Software as a Service (SaaS), Platform as a Service (PaaS) & Infrastructure as a Service (IaaS). Fig. 1 portrays the services that cloud provides.

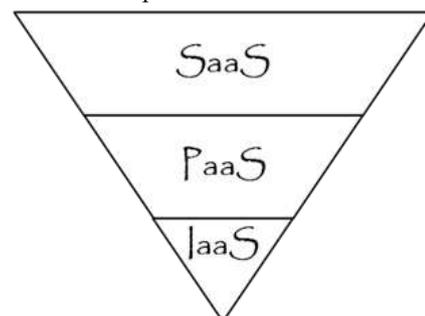


Fig. 1: Cloud Service Model

A. Software as a Service (SaaS)

Software as a Service (SaaS) refers to applications delivered as cloud services where users are provided with finished applications. Applications are delivered through internet, instead of installing and downloading it user can access it. Here, the user don't have the right to control or manage infrastructure of the cloud but can use the software utility. SaaS helps to free from complex software and hardware management, to extend its relationship with users. Examples are Gmail, Google Apps...etc.

B. Platform as a Service (PaaS)

Platform as a Service (PaaS) is an environment for application development with seamless Integration with Cloud for application hosting. The application hosted can be accessed from anywhere by the cloud users. Users have their right to control the application design but they can't control the physical infrastructure. Before the user deploys the application, a confirmation must be made whether the application or software is supported by the cloud service provider. Examples are Microsoft Azure, Google Apps Engine and Aptana cloud.

C. Infrastructure as a Service (IaaS)

Infrastructure as a Service (IaaS) provides an on-demand computing capacity from a service provider which is virtualized hardware and storage. Instead of buying resources, users have to pay for their usage. Examples are Drop Box, Amazon EC2 and IBM computing on demand.

III. CLOUD DEPLOYMENT CLASSIFICATION

Cloud deployment have been classified as Public Cloud, Private Cloud, Community Cloud and Hybrid Cloud which are also referred as deploy model and they describe the scope of services offered on the cloud to the customers.

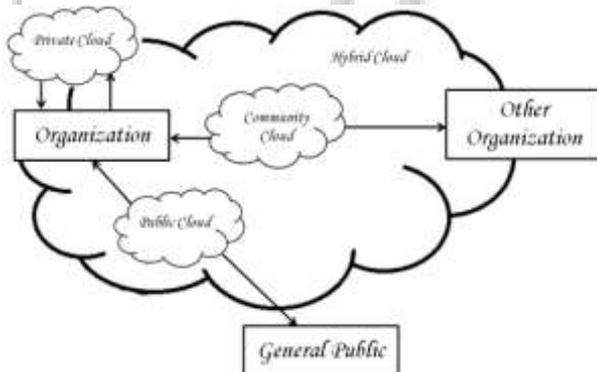


Fig. 2: Deployment model of Cloud Computing

The Fig. 2 shown above depict the cloud computing deployment model of cloud computing through which the deploy model can be understand in a better way.

A. Public Cloud

Cloud is made available in a pay-as-you-go manner to the general public is referred as Public Cloud. Public cloud users are untrustworthy; therefore, security and privacy are big concerns of this cloud.

B. Private Cloud

It is a cloud operated solely for an organization and considered to be secure when compared to Public Cloud.

Private clouds are not available to general public.

Community Cloud - It is similar to private clouds but the cloud infrastructure and computing resources are shared by several organizations and supports a specific community purpose.

C. Hybrid Cloud

This cloud is the combination of two or more public cloud, private cloud and community cloud. The clouds are bounded by standard technology that enables data and application probability.

IV. CLOUD CHARACTERISTICS

Cloud Computing system exhibits various characteristics and satisfy many of it's, which make way for the future application development and services. Some of the important characteristics of cloud are list out here which are as follows.

A. On-demand self-service

Automatic provision on the cloud services such as processing power, server time and storage are carried out as needed by the users without human interaction.

Extended Network Access - Users can access the cloud resources through internet from anywhere and anytime through standardized mechanism as location independent.

B. Measured Service

Cloud service provider monitor, optimize and control the cloud resources and services to the users as pay-as-per-use service model.

C. Elasticity

Computing resources can be continuously and elastically provisioned and provided to the users based on the demand. Users view these resources as unlimited and can be purchased in any quantity at any time.

D. Resource Pooling

To access the resources, users are location independent such that they have no knowledge on the location. Various physical and virtual computing resources are pooled in cloud and they are dynamically assigned to the users based on the demand.

E. Multitenancy

Cloud computing provides services to multiple users at the same time. Those users share the cloud at various levels and each user is isolated within his customized virtual application instance.

F. Cost Effectiveness

Instead of investing in complex and expensive computing structure and services, users are allowed to lease cloud resources and purchase the services that match their needs.

G. Reliability

In cloud data's can be stored in multiple servers to achieve reliability which makes the cloud for disaster recovery and business continuity.

H. Scalability

Cloud computing is scalable infrastructure. New nodes can

be added to cloud and servers with minor modification in cloud infrastructure and software.

I. Customization

Cloud is a reconfigurable environment that can be customized and adjusted in terms of infrastructure and applications based on user demand.

J. Maintenance

Cloud does not require any application to be downloaded and installed, so the maintenance of the cloud is not so complicated. Moreover a cloud service provider reduces the software and hardware maintenance that burden the users.

V. CONCLUSION

Cloud computing is an emerging technology to satisfy customer needs. This paper provides an idea about cloud computing, deployment model, cloud services and characteristics. Cloud computing is an intelligent technology for all kind of online business development and data sharing. It also provides an environment to users to run their application in shared environment and based on their demand. Growth of cloud is improved very well based on the search trends and it is hope to reach all kinds of business in the world.

ACKNOWLEDGEMENT

We would like to thank Dr. V Venkatesa Kumar Ph.D., and Mr. M Newlin Rajkumar M.S., M.B.A., (Ph.D), Assistant Professors, Anna University, Regional Centre – Coimbatore, India, for their wonderful contribution which helped us to learn about Cloud Computing in various aspects and all our family members who stands behind our victory.

REFERENCES

- [1] Hardeep Singh, "Cloud Computing: An Internet Based Computing", International Journal of Computers and Technology, 2012, vol.2.
- [2] Michael Armbrust, Armando Fox, Rean Griffith, Anthony D. Joseph, Randy Katz, Andy Konwinski, Gunho Lee, David Patterson, Ariel Rabkin, Ion Stoica, and Matei Zaharia "Above the cloud: Berkeley view of Cloud Computing", 2009.
- [3] P Mell and T Grance, "Cloud Computing Definition", NISTE, Version 15, 10-7-09.
- [4] <https://www.hpcloud.com/>
- [5] www.appliedcloudengineering.com