

International Journal of Computer Science and Mobile Computing



A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IJCSMC, Vol. 2, Issue. 5, May 2013, pg.435 – 440

RESEARCH ARTICLE

Cloud Computing- A Study of Infrastructure as a Service

Sukhdev Singh Ghuman

Dept. of Comp.Sci., SBDSM Khalsa College, Domeli (Kapurthala), Punjab, India
ghumanggg@gmail.com

Abstract— Cloud computing is a promising technology of the present and the future which uses the grid computing as its backbone. Cloud computing is the hottest topic of information and communication technology (ICT) for implementing it for individual, communities and business. It provides services such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). It provides many benefits like scalability and pay per use etc. Different deployment models are also available to fulfill the needs of the business and industry.

Keywords— Cloud computing, Network, Model, Infrastructure, Platform

I. INTRODUCTION

Cloud computing is when we store our data or photos on some server and later access it from anywhere using social networking sites or any other client software. It is delivering resources over the internet. Cloud computing is main technology which is used for easy and portable computing. With Cloud computing application software can be operated using internet-enabled devices [4]. This study paper gives brief introduction to cloud computing in the first section. The second section explains Cloud computing characteristics while deployment models are discussed in the third section. The last section tries to study in depth Infrastructure as a service (IaaS). Conclusion summarises the whole paper at the end.

II. CLOUD COMPUTING

Cloud computing [1] is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction .

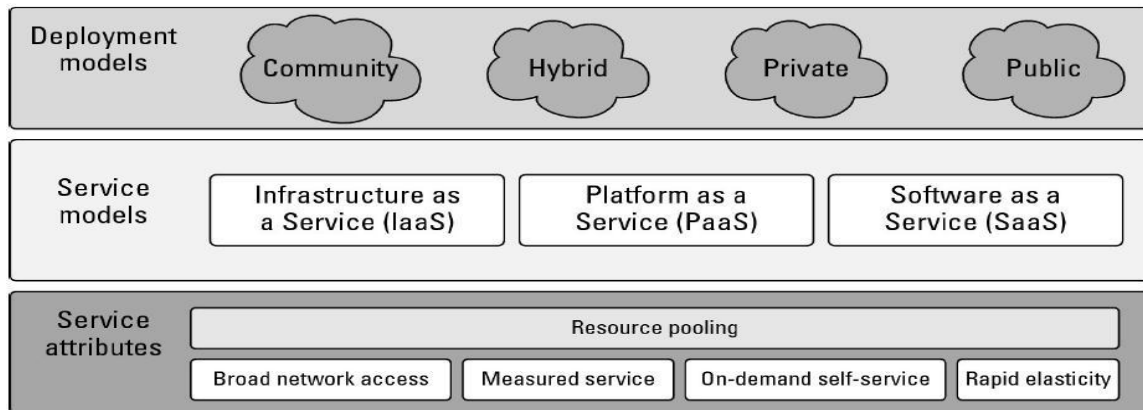


Figure 1: NIST definition of Cloud Computing [1]

Resources are pooled and offered on-demand with ubiquitous network access to rapidly configurable and elastic IT capabilities. The three types of services provided by cloud are:-

Software as a Service (SaaS)

The user runs applications on the provider's cloud infrastructure, which is accessible from client devices. The consumer does not control the infrastructure, but may be able to apply user-specific application configuration settings [3].

Platform as a Service (PaaS)

The consumer may deploy consumer-created or acquired applications on the provider's infrastructure, in formats supported by the provider. The consumer still does not manage or control the underlying cloud infrastructure, but has control over the deployed applications [3].

Infrastructure as a Service (IaaS)

Consumers may provision processing, storage, networks, and other fundamental computing resources, and may deploy and run arbitrary software over the provider's infrastructure. The consumer does not manage or control the underlying cloud infrastructure, but does have control over operating systems, storage, and deployed applications [3].

The key benefits of providing computing power using Clouds are [2]:

- i. Avoidance of expensive computer systems configured to cope with peak performance.
- ii. Pay-per-use solutions for computing cycles requested on-demand.
- iii. Avoidance of idle computing resources, resulting in novel business models.

III. CLOUD COMPUTING CHARACTERISTICS

On-demand self-service

A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.

Broad network access

Capabilities are available over the network via thin or thick client platforms, such as mobile phones, tablets, laptops, and workstations.

Resource pooling

Multiple consumers are served using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand.

Rapid elasticity

The providers can automatically provision and release resources according to the demand. To the consumer, the capabilities often appear to be unlimited and can be appropriated in any quantity at any time.

Measured service

Cloud systems automatically control and optimize resource use by leveraging a metering capability [1]. Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

IV. DEPLOYMENT MODELS

The different deployment models of Cloud computing are as shown below in figure 2.

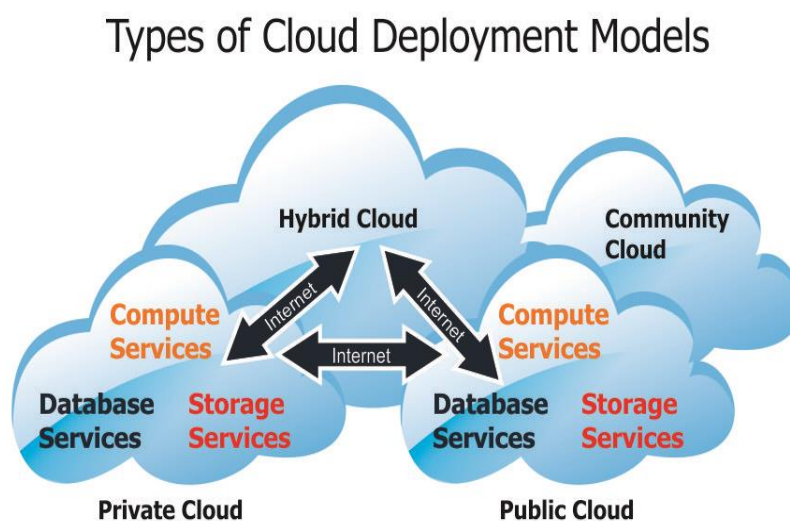


Figure 2: Cloud Deployment Models [5]

Public cloud

Public cloud is cloud computing where resources are dynamically provisioned on an on-demand basis over the Internet by using web applications or application program interfaces (API). The private cloud services are provided by a third-party who bills as per usage [3]. The cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider [1].

Private cloud

The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers [1]. A private cloud provides computing environment by consolidating shared services on virtualized hardware deployed from a primary data center to serve local and remote users [3].

Hybrid cloud

A hybrid cloud provides computing services by integrating public cloud services and private cloud services. Some service can be hired for specific functions that are too costly to maintain on-premise such as virtual server disaster recovery, backups and development environments [3].

Community cloud

A community cloud is formed when several organizations with similar requirements share common infrastructure [3]. The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns. It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises [1].

V. INFRASTRUCTRE AS A SERVICE

Infrastructure as a Service (IaaS) is one of the three fundamental service models of cloud computing. It provides access to computing resource in a virtualized environment to all the users connected via a public connection, usually the internet.

In the case of IaaS the computing resource provided is specifically that of virtualized hardware or computing resources. These computing resources include virtual server space, network connections, bandwidth, IP addresses and load balancers. The pool of hardware resource is pulled from a large number of servers and networks usually distributed across numerous data centers. The whole infrastructure is maintained by cloud service provider. The client, on the other hand, is given access to the virtualized components in order to build their own IT platforms.

In common with the other two forms of cloud hosting, IaaS can be used business users to create cost effective and easily scalable IT solutions where the complexities and expenses of managing the

underlying hardware are outsourced to the cloud provider. If the scale of a business shrinks or expands, they can accordingly tap into the cloud resource as and when they need it rather than purchase hardware themselves.

BENEFITS OF IaaS AS A SERVICE

Infrastructure

Infrastructure can be hired from the cloud service provider as per usage in public cloud deployment. Expanding business can scale the infrastructure very easily.

Cloud hosting

The hosting of websites on virtual servers in cloud can benefit from the redundancy provided by the cloud infrastructure.

Virtual Data Centers (VDC)

These are interconnected virtual servers which can be used to offer enhanced cloud hosting capabilities or to integrate all of these operations within either a private or public cloud implementation.

Scalability

Resource is available as and when required. The business can be expanded without delay.

No investment in hardware

The physical hardware that supports an IaaS service is set up and maintained by the cloud provider, saving the time and cost of the client.

Pay as per usage

The service can be accessed on demand and the client only pays for the resource that they actually use.

Location independence

The service can be accessed from any location as long as there is an internet connection.

Physical security

Services available through a public cloud, or private clouds hosted externally with the cloud provider, benefit from the physical security afforded to the servers which are hosted within a data center.

No failure time

If one server or network switch fails, the whole service will not be affected due to redundancy of infrastructure.

VI. CONCLUSIONS

This paper reviews the recent advances of Cloud computing and presents the views on Cloud computing including its definition, key features and enabling technologies. The perspective study aims to contribute the evolution of the Cloud computing paradigm. In this paper the detailed study a

very important computing models, cloud computing has been presented. I think it is technology of the present as well future which will replace almost all the infrastructure from user end to cloud service provider. Cloud computing appears to be the promising model for future computing so there is great scope of future research in this area.

REFERENCES

- [1] "NIST Cloud Computing Definition", NIST SP 800- 145 Sept. 2011
- [2] Mila Ivona Brandic, Schahram Dustdar, Vienna University of Technology Cloud v/s Grid Computing Technology comparison Information Technology 53 (2011) Special Issue
- [3] <https://na.theiaa.org>
- [4] http://en.wikipedia.org/wiki/Cloud_computing
- [5] <https://www.techinmind.com>