



## Introduction to Cloud Computing

<sup>1</sup>Alka Bansal, <sup>2</sup>Money Sethi, <sup>3</sup>Pooja Rani, <sup>4</sup>Deepika Sharma

(<sup>1, 2, 3, 4</sup>)Research Scholar (Pursuing M.Tech), Adesh Institute of Engineering and Technology, Faridkot

### ABSTRACT

The Cloud computing is a fastest growing area in IT industry, computing and research industry. Cloud is a pool of virtualized computer resources. A cloud can support self-redundant, self-recovering and scalable programming models that allow data to recover from any hardware/software failures. With the advent of this new technology, you can access the data online if you have an access to the internet. The intent of this paper is to have a review on cloud computing, how it works, services of cloud computing and its deployment models, benefits and challenges.

### KEYWORDS:

Clouds; Cloud computing; Services; Deployment models; Challenges.



# Council for Innovative Research

Peer Review Research Publishing System

**Journal:** INTERNATIONAL JOURNAL OF COMPUTERS AND TECHNOLOGY

Vol. 13, No. 8

[editorijctonline@gmail.com](mailto:editorijctonline@gmail.com)

[www.ijctonline.com](http://www.ijctonline.com), [www.cirworld.com](http://www.cirworld.com)



## INTRODUCTION

When we use social networking website or webmail to save the data online rather than home computer then it means we are using cloud computing service. Cloud computing refers to the delivery of computing resources over the internet. Instead of saving the data on our hard-drive, we can use the cloud computing services to store the data online. We can use the cloud computing in our personal and professional life. As much we explore the services of cloud computing, we may experience that some of the services makes our life easier.

## Cloud Computing

Cloud computing is a type of computing that relies on sharing the computing resources rather than having the local servers or personal devices to handle applications. In cloud computing, the word cloud is used as a metaphor for "the Internet," so the phrase *cloud computing* means "a type of Internet-based computing," where different services — such as servers, storage and applications — are delivered to an organization's computers and devices through the Internet [1]. Cloud service is very popular now a days because one can access their account on social networking website ,photo-service online at a minimal cost .One of the biggest cloud computing service is email. The email clients, if it is Yahoo!, Gmail, Hotmail, and so on, takes care of housing all of the hardware and software necessary to support your personal email account.

When you want to access your email you open your web browser, go to the email client, and log in [2]. This is only done if there is an internet access. Your email is not housed on your physical computer; it is accessed through an internet connection, and you can access it anywhere. If you are on a walk, sitting in the park or having tea down the street, you can access your email as long as you have access to the internet. Email is different than software installed on your computer. When you want to write a document you access the software like notepad, MS word etc that document will reside on your physical computer till the time you move it. But when you save the same document in your email, you can access that document anywhere if access to internet is there. Except instead of accessing just your email, you can choose what information you have access to within the cloud [3].

## How Cloud Computing works?

Before we learn how cloud computing works. We let's understand what the term "cloud" refers to. There are different incarnations of the cloud in the world. It mostly means grid of computers serving as a service –oriented architecture used to deliver software and data.

Now let's consider that cloud consists of layers-front end layers and back end layers. The front end layers that you see and interact with. When you access your profile on your Yahoo account for example, you are using software running on the front end of the cloud. The back end consists of the hardware and the software architecture that delivers the data you see on the front end.

Clouds use a network layer to connect users' end point devices, like computers or smart phones, to resources that are centralised in a data centre. Users can access the data centre via a company network or the internet or both. Clouds can also be accessed from any location, allowing mobile workers to access their business systems on demand.

Applications running on the cloud take advantage of the flexibility of the computing power available. The computers are set up to work together so that it appears as if the applications were running on one particular machine. This flexibility is a major advantage of cloud computing, allowing the user to use as much or as little of the cloud resources as they want at short notice, without any assigning any specific hardware for the job in advance [12].

## Cloud computing services

Once the cloud is established, how its cloud computing services are deployed in terms of models depend on its requirements. There are three types of cloud computing services that you can subscribe to: Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).

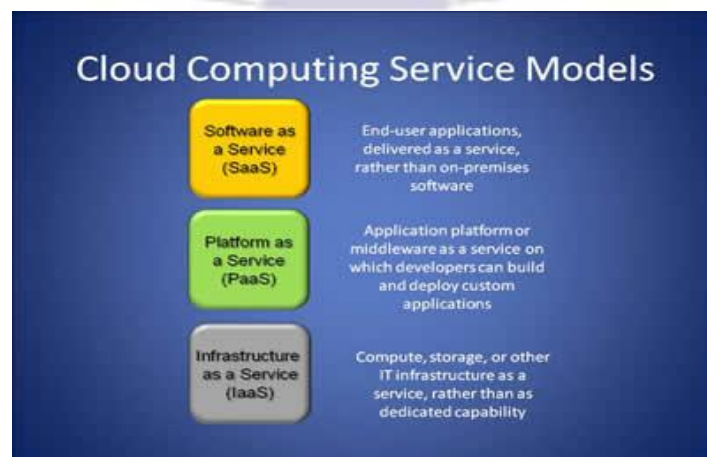
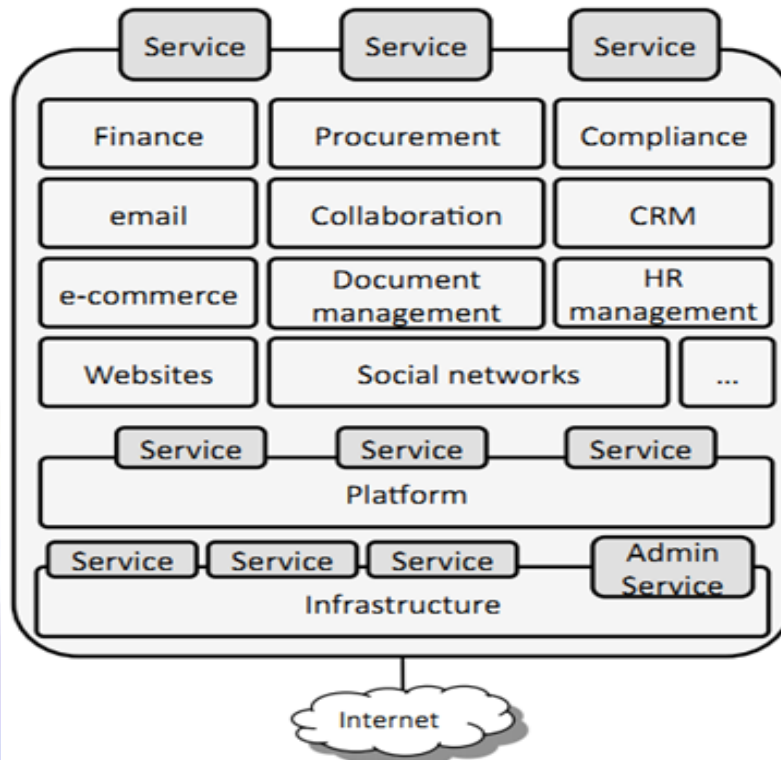


Fig 1. Cloud Computing Service models

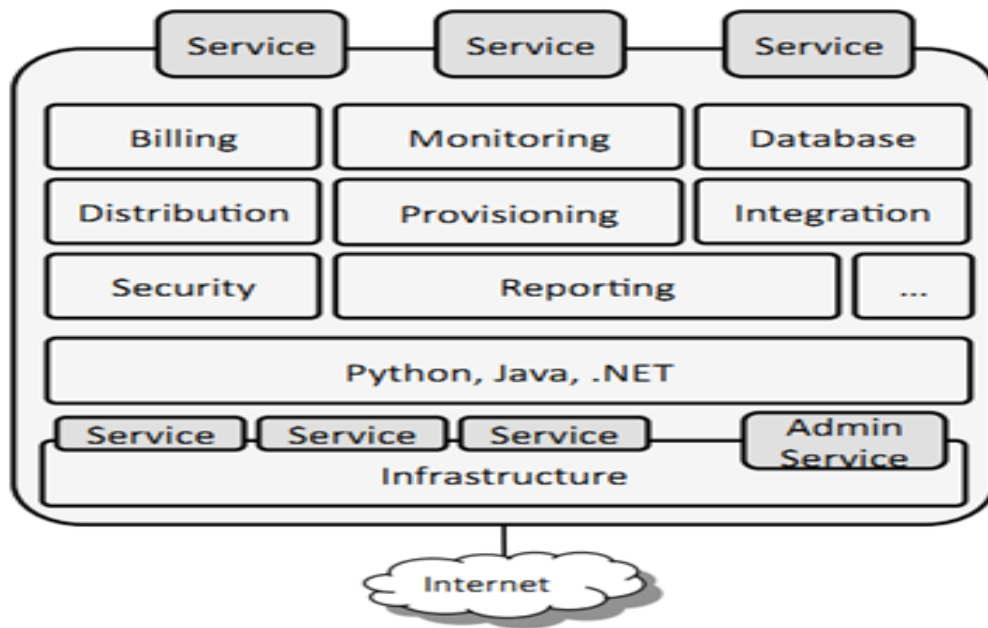
**1. SaaS**-Software-as-a-Service provides complete applications to a cloud's end user. It is mainly accessed through a web portal and service oriented architectures based on web service technologies[4].SaaS sometimes referred as Services or Application clouds as it runs on distant computers in the cloud that are owned and operated by others and that connect to user's computer via internet. The services on the application layer can be seen as an extension of the ASP (application service provider) model, in which an application is run, maintained, and supported by a service vendor. The main difference between the services on the application layer and the ASP model is the encapsulation of the application as a service [5].Figure 2 shows Software as a service stack.



**Fig2. Software as a service stack**

**2. PaaS**-Platform as a service is another model and it supplies all the resources required to develop the applications and services completely over the internet without having any requirement of installing or downloading the software. PaaS is also known as a Cloud ware [6]. PaaS makes the use of dedicated APIs. Platform as a Service allows users to create software applications using tools supplied by the provider.PaaS consist of features that a customer is subscribe to; they can choose that features that meet their requirements while others are discarded. Below are some of the features that can be included with a PaaS offering [7]:

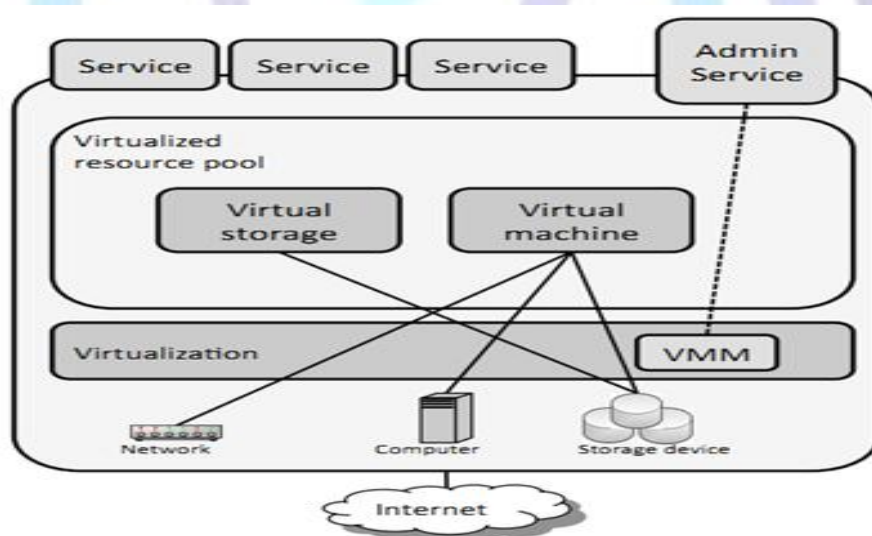
- Operating system.
- Server-side scripting environment.
- Database management system.
- Server Software.
- Support.
- Storage.
- Network access.



**Fig3.Platform as a Software Stack**

**3. IaaS-** Infrastructure as a service is one of the fundamental service models of cloud computing alongside SaaS and PaaS. It is also known as Resource Clouds and it provides organizations with computing resources along with servers, networking, storage and data centre space on pay per use basis. Characteristics and components of IaaS include [8]:

- Utility computing service and billing model.
- Automation of administrative tasks.
- Dynamic scaling.
- Policy-based services.
- Internet connectivity.



**Fig4. Infrastructure as service stack**

## Cloud Computing Deployment Models

One can subscribe to the following deployment models depending on their needs. There are four different deployment models of cloud computing with special characteristics that support the needs of services and users of clouds in particular ways.

**1. Public cloud-** A public cloud is a cloud computing model in which services such as applications and storage are available publicly over the internet. Examples of public clouds are IBM's Blue Cloud, Sun Cloud and Google App Engine. In this model, customers have no visibility or control over where the infrastructure is located. The computing infrastructure is shared between organizations.

**2. Private cloud-** Private cloud is a cloud infrastructure dedicated to a particular organization and not shared between any organizations. Private clouds allow businesses to host applications in the cloud, while addressing concerns regarding data security and control, which is often lacking in a public cloud environment. It is not shared with other organizations, whether managed internally or by a third-party, and it can be hosted internally or externally [9]. Private clouds are more secure and more expensive as compared to public clouds.

**3. Hybrid cloud-** Hybrid cloud is a composition of both public cloud and private cloud. Organizations may host critical applications on private clouds and applications with relatively less security concerns on the public cloud. A related term is Cloud Bursting. In Cloud bursting organization use their own computing infrastructure for normal usage, but access the cloud using services like Sales force cloud computing for high/peak load requirements. This ensures that a sudden increase in computing requirement is handled gracefully [10].

**4. Community cloud-** Community model is multi-tenant cloud service model that is shared by several organization which supports specific community. These communities have similar requirements. Community clouds are a hybrid form of private clouds built and operated specifically for a targeted group. In government organizations within a state where there is a need to share resources community cloud is best.

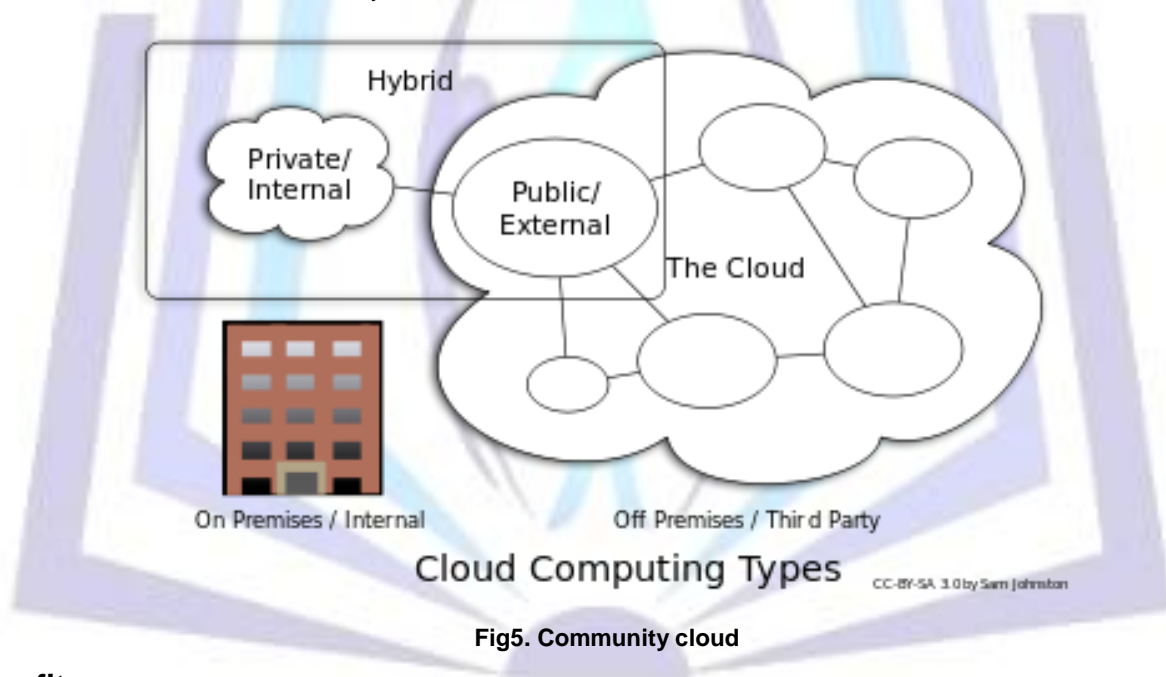


Fig5. Community cloud

## Benefits

If used properly and to the extent necessary, working with the data in the cloud can vastly benefit all types of businesses. The following are the benefits of the cloud computing.

**1. Storage-** Storing the data in the cloud gives you the unlimited storage space. So one needn't worry about extending the storage space.

**2. Backup and recovery-** As all the data is stored in the cloud, so it becomes easier to have backup and restoring the same as compared to any physical device.

**3. Easy access of data-** Once you are logged in the cloud, you can easily access the data from anywhere in the world where there is an internet connection.

**4. Scalability-** You can scale up and scale down your storage needs and operation according to your requirements. The cloud computer service provider can handle the installing of expensive upgrades by itself.

**5. Cost Efficient-** Cloud computing may reduce the cost of managing and maintaining your IT systems. Rather than purchasing expensive systems and equipment for your business, you can reduce your costs by using the resources of your cloud computing service provider.



## Challenges

There are some of the notable challenges in cloud computing written below and some of them can cause slow down when delivering the services.

**1. Performance and Bandwidth-** Companies can save money in case of hardware but they have to spend more money in case of bandwidth. This can be low for small applications but high for data-intensive applications. When there is a need to send intensive and critical data over the network, more bandwidth is required.

**2. Continuously evolving-** User requirements are continuously evolving, as are the requirements for interfaces, networking, and storage. This means that a “cloud,” especially a public one, does not remain static and is also continuously evolving [11].

**3. Compliance requirements-** Cloud computing services can challenge the various compliance audit requirements. Data location and IAM are all the challenges in the compliance audit efforts.

## References

1. Appcore-Types of cloud computing <http://blog.appcore.com/blog/bid/167543/Types-of-Cloud-Computing-Private-Public-and-Hybrid-Clouds>.
2. Cloud competence center-Service models <http://www.cloud-competence-center.com/understanding/cloud-computing-service-models/>.
3. Cloud lounge- How cloud computing works <http://www.cloud-lounge.org/how-do-clouds-work.html>
4. Dialogic-Challenges-Continuously evolving. <http://www.dialogic.com/~media/products/docs/whitepapers/12023-cloud-computing-wp.pdf>
5. Interoute-PaaS <http://www.interoute.com/what-paas>.
6. South cattede-PaaS. [http://south.cattedecom.com/rts/Technologies/CloudComputing/0071626948\\_chap01.pdf](http://south.cattedecom.com/rts/Technologies/CloudComputing/0071626948_chap01.pdf)
7. Searchcloudcomputing.target-aaS <http://searchcloudcomputing.techtarget.com/definition/Infrastructure-as-a-Service-aaS>.
8. The cloud tutorial-Hybrid Clouds <http://thecloudtutorial.com/cloudtypes.html>
9. Us cert-Cloud computing. <http://www.uscert.gov/sites/default/files/publications/CloudComputingHuthCebula.pdf>
10. Webopedia-Cloud computing [http://www.webopedia.com/TERM/C/cloud\\_computing.html](http://www.webopedia.com/TERM/C/cloud_computing.html)