

# Cloud Computing Service Providers And Applications

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**ABSTRACT:** Cloud computing is making a revolutionary change in IT industries and other organizations. Amazon, Hp, Google, Microsoft, IBM, Salesforce are the top cloud service providers. Cloud provides different types of services such as SaaS, IaaS, PaaS. Different organizations choose cloud because of its efficiency, scalability and high utilization. This paper deals with the various cloud computing services and applications.

**Keywords :** Scalability; Elasticity; EC2; S3; SaaS; PaaS; IaaS; Ubiquity

## 1 INTRODUCTION

Cloud computing is an emerging trend and it provides services from anywhere in the world only with the help of internet access. It has the ubiquity nature of delivering services from remote servers. It offers "sharing of web hosting". Even though security is a main issue in cloud organizations start adopting it because of its flexibility.

## 2 TYPES OF CLOUD

### 2.1 Private Cloud

A cloud that operates for a particular organization and can be accessed only by that organization. Hosting is done by the organization.

### 2.2 Public Cloud

A cloud that can be accessed by the public. It is managed by the cloud service provider.

### 2.3 Hybrid Cloud

A cloud that contains combination of both private and public clouds.

### 2.4 Community Cloud

Sharing of resources and infrastructure is done between organizations that have the same policies and missions. An online library that is shared between different educational institutions can be said as an example.

## 3 CLOUD COMPUTING SERVICE TYPES

### 3.1 SaaS

Software as a Service. It provides to store data online without having to store files in computer hardware. Examples are Google Docs, Gmail.

### 3.2 PaaS

Platform as a Service. In this the users can develop softwares with the help of online tools that are made available by the CSP. Examples are Force.com, Google App Engine.

### 3.3 IaaS

Infrastructure as a Service. In this the customers do not need a real hardware to be built by them. Here servers from the cloud service provider is taken for rent by the customers. Examples are Amazon EC2, Rackspace.

**TABLE 1**  
CLOUD SERVICE COMPARISONS

SaaS
Provides E-mail services, Games
PaaS
Provides online tools for developing applications
IaaS
Provides virtual servers and online data storage

**TABLE 2**  
CLOUD SERVICE EXAMPLES

SaaS
Examples are Microsoft office 365, Zoho, Google Docs
PaaS
Examples are Aptana, Google App Engine, Salesforce
IaaS
Examples are Windows Azure, Dropbox, Akamai.

## 4 ELASTICITY AND SCALABILITY IN CLOUD COMPUTING

Cloud provides both Elasticity and Scalability.

### 4.1 Elasticity

Elasticity in cloud computing provides handling of workload even if the number of users increase beyond the specific current number of users. For example, it can handle the workload even if a website has 1 million users and a sudden popularity of the website increases the number of users to 2 million.

### 4.2 Scalability

It can be defined as the ability to handle workload variability on its current resources. An example for scalability is if a website has 5 million users and only 2 million active users. But all of a sudden there is an increase in traffic, the website's active number of user's is increased to 4 million and the usage time of the website also increases. Cloud provides the scalability to handle this workload.

## 5 PROS AND CONS OF CLOUD COMPUTING

### 5.1 Pros

1. It is scalable and flexible.
2. It provides large data storage.
3. Hardware and software maintenance is done by the cloud service provider itself.
4. As sharing of resources is done, it consumes less power.
5. Companies can go for cloud as it is very cost efficient.

It can be said as "Green Computing" as it emits less carbon.

### 5.2 Cons

1. Security breach may occur as it is hosted by third parties.
2. Without proper internet access cloud will be a failure.
3. The infrastructure may be changed depending on the service provider's preference without the consumer's consent.

## 6 THE ORIGIN OF CLOUD COMPUTING

This idea originated in 1960s when John McCarthy told computation would be a public utility someday. The term "Cloud Computing" was first used by Ramnath Chellappa in a lecture in the year 1997 and this term was used publicly by Google CEO Eric Schmidt in a conference in the year 2006. Salesforce.com in the year 1999 was the first to offer cloud service to the public specialized in SaaS. After this Amazon provided cloud services since the year 2002. It launched EC2 in the year 2006 and significant participation to the cloud service from Google is the offering of Google Apps and also Microsoft launched its cloud service.

## 7 COMPANIES LAUNCHING CLOUD SERVICE

Cloud provides a large data storage. Flickr, the online photo sharing site provides 1TB of data which uses cloud for the storage of data. In the top list of companies launching cloud service Adobe has also joined the list. It has acquired Behance on December 20<sup>th</sup>, 2012, a social network for creative professionals to share their work. It has launched the cloud service to the users with a subscription option providing online tools and storage place. With this the users can create their own profile within minutes and also helps them to share their work more easily.

## 8 CLOUD SERVICE PROVIDERS (CSP)

The most popular cloud service providers are listed in this section.

### 8.1 Amazon Web Services (AWS)

AWS is an online cloud platform. It provides services such as Amazon EC2 and Amazon S3. It allows Hadoop to run on EC2 and S3.

### 8.2 Amazon Elastic Cloud Compute (EC2)

Cloud computing provides an elasticity in allocating resources depending on the website's traffic. In precise cloud computing can be said as an "Elastic Computing". An example can be Amazon EC2. It provides the resources or servers depending on the website's increase or decrease in traffic. Auto Scaling mechanism enables to run Amazon EC2. It enables scaling of

resources depending on the workload variability.

### 8.3 Amazon Simple Storage Service (S3)

Amazon S3 provides the online storage of data. It charges users depending on the storage of data. It provides scalability in data storage.

### 8.4 Hadoop, Cloud in Amazon EC2 and S3

After cloud, Hadoop has grabbed the attention of companies. Hadoop is an open source software for the distribution of data. Hadoop and cloud together are used to increase the scalability and flexibility. Amazon allows "Hadoop" to run on both EC2 and S3.

### 8.5 Amazon Route 53

It is a highly available DNS (Domain Name System) service. It translates and maps the domain names to IP addresses.

### 8.6 Amazon VPC

It allows to create a Virtual Private Cloud for a particular organization. In this, the customers are allowed to create their own IP address range.

### 8.7 Amazon SQS

It is a distributed queue system to store messages in a highly reliable and scalable manner. It provides secure and authenticated data handling. Messages are stored in multiple servers to enable highly available data.

### 8.8 Amazon SNS (Simple Notification Service)

A messaging service to deliver notifications from cloud. Notifications can be by SMS or E-mail allowed to send on mobile devices such as Android, iPhone, iPad, Kindle Fire and other internet connected devices.

### 8.9 Amazon Elastic Map Reduce

It enables processing vast amount of data cost effectively and more easily. It uses Hadoop to run on the infrastructure of Amazon EC2 and Amazon S3.

### 8.10 Amazon Simple DB

It is a distributed database allows storing, processing and querying of data sets in the cloud. It works with Amazon EC2 and S3. It is more scalable and efficient.

### 8.11 Amazon CloudFront

It works integrated with Amazon S3, EC2, Amazon Elastic Load Balancing and Amazon Route 53. It is a CDN (Content Delivery Network) used to increase performance and availability. Users can pay only for the content and data transfer they utilize.

### 8.12 Amazon Relational Database (RDB)

It is a service that runs on cloud. It allows scaling of database more easily. Backup of database is stored automatically. Failure detection and fault recovery is also done by Amazon RDB. It supports MySQL, Oracle, Microsoft SQL Server.

## 9 HP CLOUD SERVICES

Some of the cloud services of HP are listed here.

### 9.1 HP Cloud Block storage

It provides an increased I/O, high performance and fast access to the file systems, databases and other applica-

tions. Cloud Block storage is ideal for web applications. It allows users to create backups of data and the users can access it whenever required. It makes use of RAID to replicate the data and retrieve them even if hardware failure occurs. It provides scalable data to manage demand variability.

### 9.2 Hp Cloud Identity Service

It provides a single method to manage user identity and authentication.

### 9.3 Hp Cloud Compute

It is a public cloud service that provides virtual servers that are customizable. It is built on OpenStack open source environment. It is an operating system for cloud computing which provides scalability and flexibility.

### 9.4 Hp Object storage

It is a public cloud storage service. It provides a highly available data as redundant copies of data are available.

### 9.5 Hp Cloud CDN

It refers to Content Delivery Network. Hp Cloud CDN contains "edge servers" which are geographically distributed. It provides fast access to the users by routing contents to local servers that are nearest to the customers.

## 10 MICROSOFT CLOUD SERVICE

The different Microsoft cloud services are

### 10.1 Windows Azure

It provides PaaS and IaaS services. It is used to develop web applications and allows them to run cloud servers. These apps can be built using different programming languages.

### 10.2 Sql Azure

A cloud service that makes use of a specialized version of Microsoft SQL server. It stores the data using multiple copies of database and hence providing high availability, elasticity and scalability.

### 10.4 Windows Azure Marketplace

An online market to buy and sell Windows Azure Applications. For application developers it is available on both free and premium basis. It is also available on a free trial basis.

## 11 CLOUD COMPUTING APPLICATIONS

Some of the cloud applications are listed here.

### 11.1 Gmail

It is a commercial e-mail service offered by Google. It allows chat facilities and video calls.

### 11.2 Google Docs

It is an online storage service integrated with Google Drive. It allows to store pdf files, zip files, presentations, spreadsheets, word documents, powerpoint, excel. Google drive allows to store photos.

### 11.3 Dropbox

It is a free service allowing to store large data files such as video, audio and text files. It is also available on a paid basis if users want to upgrade it.

### 11.4 Evernote

It is available on both free and paid basis enabling users to store their data. It allows users to take notes, clipping of web pages they want with "share and tag" options. It also allows to search their notes using keywords, allowing to set reminder and to notify the user, capture audio, photos.

## 12 SECURITY ISSUES IN CLOUD

As cloud is hosted by third parties there is chance for security breach. The users have no control over their own data. Hence for privacy concerns cloud is not much trusted. This is a reason why certain companies hesitate to go for cloud as they do not want their confidential data to be hosted by a third party.

## 13 PROTECTION AGAINST LOSSES

Companies who fear of data losses can still go for cloud as cloud insurance is available. A cloud insurance provides the backup of data to the customers but does not pay them financially. An SLA is a written agreement between the customer and the service provider only. An SLA may contain written agreements like the available service time, and what percentage of users it can provide the service simultaneously. Any changes in the network from the service provider should be previously notified.

## 14 CONCLUSION

This paper highlighted some of the cloud services and applications. Cloud provides infrastructure and no capital investment is needed. As small companies do not have much fund to build their own infrastructure cloud is definitely a better option. Software and Hardware upgradation is maintained by the cloud service providers and companies can concentrate more on developing their own company. The main underlying issue in cloud is providing security. If privacy issues are overcome cloud will be the best option for all companies.

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