

## Study of Cloud Computing and Overview

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**Abstract:** *Cloud computing is the web based processing where the data, application and infrastructure are provided to computers and other devices on demand over the network. Clouds contain vast amounts of information and provide a variety of services to large numbers of people. It is a style of computing which is having dynamically scalable virtualized resources provided as a service over the Internet. It reduces the time required to obtain heavy resources and boot new server instances in minutes, allowing one to quickly scale capacity, both up and down, as ones requirement changes. This paper provides brief details about the cloud computing with an overview of key features to give a quick look about the new focused technology.*

**Keywords:** *Cloud computing, Deployment , Pooled resource ,Reliability, Scalability*

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### I. INTRODUCTION

Cloud computing is the delivery of computing services over the Internet. Typically, the Internet is represented in network as cloud[1]. The term cloud[2] originates from the world of telecommunications when providers began using virtual private network (VPN) services for data communications. Cloud computing simply means Internet computing, generally the Internet is seen as collection of clouds; thus the cloud computing is defined as utilizing the internet to provide technology enabled services to the people and organizations[3]. Cloud services allow individuals and businesses to use software and hardware that are managed by third parties at remote locations.

The following definition of cloud computing has been developed by the U.S. National Institute of Standards and Technology (NIST):

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

Examples of cloud services include online file storage, social networking sites, webmail, and online business applications. The cloud computing model allows access to information and computer resources from anywhere that a network connection is available. Cloud computing provides a shared pool of resources, including data storage space, networks, computer processing power, and specialized corporate and user applications.

The characteristics of cloud computing include on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service. On-demand self-service means that customers (usually organizations) can request and manage their own computing resources. Broad network access allows services to be offered over the Internet or private networks. Pooled resources means that customers draw from a pool of computing resources, usually in remote data centers. Services can be scaled larger or smaller; and use of a service is measured and customers are billed accordingly[2].

### II. WHY CLOUD COMPUTING IS USED

Traditional business applications have always been very complicated and expensive. The amount and variety of hardware & software required to run them are daunting. You need a whole team of experts to install, configure, test, run, secure and update them. When you multiply this effort across dozens or hundreds of applications it's easy to see why the biggest companies with the best IT departments are not getting the applications, they need. Small and mid-sized businesses don't stand a chance.

With cloud computing you eliminate those headaches because you are not managing hardware and software that's responsibility of an experienced vendor like salesforce .com. The shared infrastructure means it works like utility. You only pay for what you need, upgrades are automatic and scaling up or down is easy. Cloud based apps can be up and running in days or weeks and they cost less. With a cloud application you just open a browser, login customize the application and start using it. Businesses are running all kind of apps in the cloud like customer relationship management (CRM), HR, accounting and much more. Some of the world's

largest companies moved their applications to the cloud with salesforce.com after rigorously testing the security and reliability of our infrastructure.

Some other benefits to users include scalability, reliability, and efficiency. Scalability means that cloud computing offers unlimited processing and storage capacity[2]. The Cloud is reliable in that it enables access to applications and documents anywhere in the world via the Internet. Cloud computing is often considered efficient because it allows organizations to free up resources to focus on innovation and product development.

### **III. TYPES OF CLOUD COMPUTING**

Cloud computing is typically classified in two ways:

1. Location of the cloud computing
2. Type of services offered

#### **a. Location of the cloud:**

Cloud computing is typically classified in the following ways:

##### **i. Public cloud:**

Public clouds are made available to the general public by a service provider who hosts the cloud infrastructure. Generally, public cloud providers like Amazon AWS, Microsoft and Google own and operate the infrastructure and offer access over the Internet. Users need to pay only for the time duration they use the service i.e. pay-per-use[2]. A public cloud does not mean that a user's data is publically visible; public cloud vendors typically provide an access control mechanism for their users[4]. Clients do not need to purchase hardware to get service and can also scale their user on demand[6]. Public clouds provide an elastic, cost effective means to deploy solutions.

##### **ii. Private cloud:**

Private cloud means using a cloud infrastructure solely by one customer or organization. In a private cloud-based service, resources are deployed inside a firewall and managed by client's organization without the restriction of network bandwidth and security exposures[4]. Organization owns the hardware and software infrastructure, manages cloud and controls access to its resources[6]. The main advantage of private cloud is, it is easier to manage security, maintenance and upgrades and also provides more control over the deployment and use. As compared to public clouds, where all resources and applications were managed by the service provider, in private cloud these services are pooled together and made available for users at the organizational level[2].

##### **iii. Hybrid cloud :**

A hybrid cloud is a cloud computing environment in which an organization provides and manages some in-house resources and has others provided externally. Hybrid cloud is a combination of private and public cloud. In this, a private cloud is linked to one or more external cloud services. The goal is to combine services and data from a variety of cloud models to create a unified automated and well-managed computing environment.

##### **iv. Community cloud :**

A community cloud is a cloud service model that provides a cloud computing solution to a limited number of individuals or organizations that is governed, managed and secured commonly by all the participating organizations or a third party managed service provider. It is multi-tenant infrastructure that is controlled and used by a group of organizations that have shared interests such as specific security requirements. Community clouds are designed for business and organizations working on joint projects, applications or research which requires a central cloud computing facility for building, managing and executing such projects[5].

#### **b. Classification based upon service provided:**

Based upon the services offered, clouds are classified in the following ways [7]:

##### **i. Infrastructure as a service (IaaS):**

Infrastructure as a Service, sometimes abbreviated as IaaS, contains the basic building blocks for cloud IT and typically provide access to networking features, computers (virtual or on dedicated hardware), and data storage space. Infrastructure as a Service provides you with the highest level of flexibility and management control over your IT resources and is most similar to existing IT resources that many IT departments and developers are familiar with today.

**ii. Platform as a Service (PaaS):**

Platforms as a service remove the need for organizations to manage the underlying infrastructure (usually hardware and operating systems) and allow you to focus on the deployment and management of your applications. This helps you be more efficient as you don't need to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other undifferentiated heavy lifting involved in running your application.

**iii. Software as a service (SaaS):**

Software as a Service provides you with a completed product that is run and managed by the service provider. In most cases, people referring to Software as a Service are referring to end-user applications. With a SaaS offering you do not have to think about how the service is maintained or how the underlying infrastructure is managed; you only need to think about how you will use that particular piece software. A common example of a SaaS application is web-based email where you can send and receive email without having to manage feature additions to the email product or maintaining the servers and operating systems that the email program is running on.

#### **IV. ADVANTAGES OF CLOUD COMPUTING**

If used properly and to the extent necessary, working with data in the cloud can vastly benefit all types of businesses. Mentioned below are some of the advantages of this technology [8]:

**a. Cost Efficient :**

Cloud computing is probably the most cost efficient method to use, maintain and upgrade. Traditional desktop software costs companies a lot in terms of finance. Adding up the licensing fees for multiple users can prove to be very expensive for the establishment concerned. The cloud, on the other hand, is available at much cheaper rates and hence, can significantly lower the company's IT expenses. Besides, there are many one-time-payment, pay-as-you-go and other scalable options available, which makes it very reasonable for the company in question.

**b. Almost Unlimited Storage :**

Storing information in the cloud gives you almost unlimited storage capacity. Hence, you no more need to worry about running out of storage space or increasing your current storage space availability.

**c. Backup and Recovery :**

Since all your data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical device. Furthermore, most cloud service providers are usually competent enough to handle recovery of information. Hence, this makes the entire process of backup and recovery much simpler than other traditional methods of data storage.

**d. Automatic Software Integration :**

In the cloud, software integration is usually something that occurs automatically. This means that you do not need to take additional efforts to customize and integrate your applications as per your preferences. This aspect usually takes care of itself. Not only that, cloud computing allows you to customize your options with great ease. Hence, you can handpick just those services and software applications that you think will best suit your particular enterprise.

**e. Easy Access to Information :**

Once you register yourself in the cloud, you can access the information from anywhere, where there is an Internet connection. This convenient feature lets you move beyond time zone and geographic location issues.

**f. Quick Deployment :**

Lastly and most importantly, cloud computing gives you the advantage of quick deployment. Once you opt for this method of functioning, your entire system can be fully functional in a matter of a few minutes. Of course, the amount of time taken here will depend on the exact kind of technology that you need for your business

## **V. DISADVANTAGES OF CLOUD COMPUTING**

### **a. Technical Issues :**

Though it is true that information and data on the cloud can be accessed anytime and from anywhere at all, there are times when this system can have some serious dysfunction. You should be aware of the fact that this technology is always prone to outages and other technical issues. Even the best cloud service providers run into this kind of trouble, in spite of keeping up high standards of maintenance. Besides, you will need a very good Internet connection to be logged onto the server at all times. You will invariably be stuck in case of network and connectivity problems [8].

### **b. Security in the Cloud:**

The other major issue while in the cloud is that of security issues. Before adopting this technology, you should know that you will be surrendering all your company's sensitive information to a third-party cloud service provider. This could potentially put your company to great risk. Hence, you need to make absolutely sure that you choose the most reliable service provider, who will keep your information totally secure[8].

### **c. Prone to Attack:**

Storing information in the cloud could make your company vulnerable to external attacks and threats. As you are well aware, nothing on the Internet is completely secure and hence, there is always the lurking possibility of stealth of sensitive data [8].

## **VI. CONCLUSION**

Cloud computing has the potential to be a innovative force by affecting the deployment and use of technology. The cloud could be the next evolution in the history of computing, following in the footsteps of mainframes, minicomputers, PCs, servers, smart phones, and so on, and radically changing the way enterprises manage IT. Yes, plenty of questions are still left to be answered regarding security within the cloud and how customers and cloud service providers (CSPs) will manage issues and expectations, but it would be a severe understatement to say simply that cloud computing has generated interest in the marketplace.

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