Cloud- an adventure to a virtual world

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Abstract: This paper gives an overview about what cloud computing actually means. A description about the types of cloud computing are also specified. This paper mainly concentrate on the advantages of cloud computing over traditional computing and applications of cloud computing in various fields, such as online storage, scalability, low investment and especially concentrates on the usage of cloud computing technology in the field of education and the innovative ideas that can be implemented to improve the usage of cloud computing technology further in the field of education making it an integral part of the education system itself. Along with the usage of cloud computing in the field of education, also the uses of cloud computing technology in the field of medicine is also explained.

Keyword: IaaS, SaaS, PaaS, NaaS.

INTRODUCTION

Cloud computing, it describe highly scalable computing resources provided as an external service via the internet on a pay and go basis. It offers IT resources including storage, networking and computing platforms on an on-demand basis. The high usability of today's cloud computing platforms makes this rapidly emerging paradigm very attractive for customers who want to instantly and easily provide web services that are highly available and scalable to the current demands. In the most flexible and general cloud computing model (*"Infrastructure as-a Service", IaaS*), customers are able to run entire Virtual Machines (VMs) inside the Cloud. VM images function as templates from which a virtually unlimited number of VM instances can be instantiated. Technologies such as cluster, grid, and now, cloud computing, have all aimed at allowing access to large amounts
of computing power in a fully virtualized manner, by aggregating resources and offering a single system view. In addition, an important aim of these technologies has been delivering computing as a utility. Utility computing describes a business model for on-demand delivery of computing power; consumers pay providers based on usage ("pay as-you-go"),Because of this cloud computing has also been called "Utility computing" or " IT on Demand ". This new, web-based generation of computing utilizes remote servers housed in highly secure data centers for data storage and management, so

organizations no longer need to purchase and look after their IT solutions in-house.

CLOUD COMPUTING DEVELOPMENT MODELS

A. Public Cloud:

Public cloud (also referred to as 'external' cloud) describes the conventional meaning of cloud computing: scalable, dynamically provisioned, often virtualized resources available over the Internet from an off-site third-party provider, which divides up resources and bills its customers on a 'utility' basis.

B. Private Cloud:

Private cloud (also referred to as 'corporate' or 'internal' cloud) is a term used to denote a proprietary computing architecture providing hosted services on private networks. This type of cloud computing is generally used by large companies, and allows their corporate network and data center administrators to effectively become in-house 'service providers' catering to 'customers' within the corporation. However, it negates many of the benefits of cloud computing, as organizations still need to purchase, set up and manage their own clouds.

C. Community cloud:

It is a multi-tenant infrastructure shared between many organizations which have the same or similar objectives or concerns.

A simple example for this is many hospitals keep a community cloud for sharing of information between each other which gives shared access about the patients who visit different hospitals and can share medical programs and applications which uses computers.

D. Hybrid Cloud:

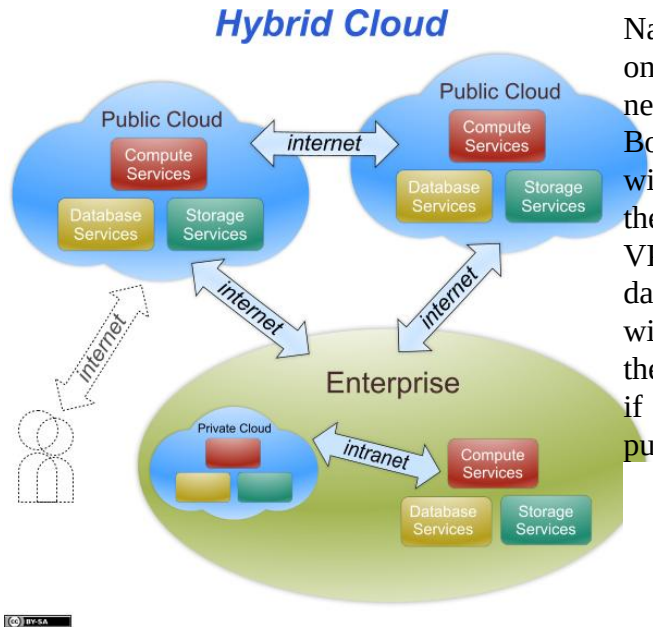
It has been suggested that a hybrid cloud environment combining resources from both internal and external providers will become the most popular choice for enterprises. For example, accompany could choose to use a public cloud service for general computing, but store its business-critical data within its own data center. This may be because larger organizations are likely to have already invested heavily in the infrastructure required to provide resources in-house – or they may be concerned about the security of public clouds.

Hybrid cloud development models consists of all the four deployments with a firewall separating them.

a. Infrastructure as a Service (IaaS)

This basically means that user buys the raw computing hardware to be used over the Internet.

It is usually brought as servers or on line storage media. The best and most common application of this type of cloud computing is buying a web hosting for the web site of the user. The user pays a monthly fee to a hosting company for the storage on their servers and to have them serve up files for the user's website from those servers whenever needed.



b. Software as a service (SaaS)

Saas is a case where the user uses the complete software application that is running on someone else's servers in a remote location. The best example of this is Google Docs, which can be used for creating and sorting text documents, presentations, spreadsheets on the cloud which is the Internet. The user need not install this software in his computer and can utilize it over the Internet as per their needs.

c. Platform as a service (PaaS)

PaaS is a case where the user creates applications using web based tools which run as software and hardware provided by another company presented for usage via the cloud. As an example, consider a situation where the user develops their own e-commerce web site but have the whole web site, including the shopping cart, check out, and payment mechanism running on a merchant's server.

d. Network as a service (NaaS)

Naas is mainly used to provide band width on demand (BoD) and virtual private networks (VPN).

BoD is a technique by which traffic band width is assigned between users based on their requirements.

VPN enables a computer to send and receive data across a public or a shared network without having to reveal the data to any of the other computers in the network. It acts as if a private network is available instead of a public network.

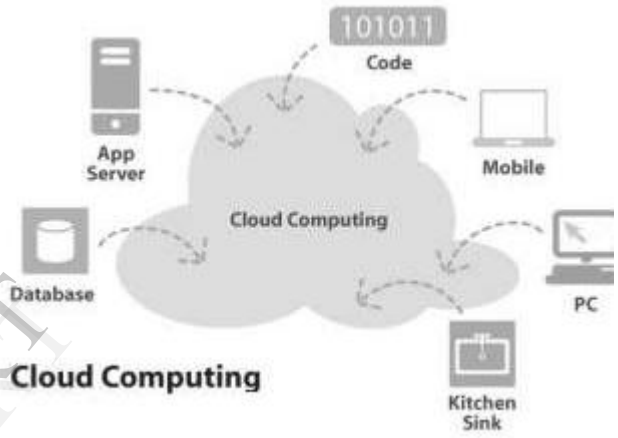


Figure 1: Cloud computing with various components

WHY SWITCH FROM TRADITIONAL IT TO THE CLOUD?

A. compatibility and maintenance

There is no need to install any software on your own computer. All the software is installed on a remote machine somewhere on the Internet and you see it. There is no need to install any sort of new hardware or software. This means that you do not have to worry about different versions of the software and its compatibility with your computer since everything runs from your browser. Since software runs on a remote server, there is no need for the user for maintenance of the software as it is done by the software provider's unlike in traditional computing where the user has to buy the

hardware compatible with the software to work on it and maintain if regularly by updating it.

B. Quick to get up and running

In traditional computing, if you need to create a to-do lists you would have to buy the software MS project, install it on your machine making sure you have the right hardware and then you get to use it. cloud computing is easier to get up running. For example, to get up and running with a clutter pad, an on line tool for various tasks. It only takes about 60 seconds to sign up. You can start creating to-do list, send messages, and upload files, chat, and much more in mere minute.

C. Low investment

In traditional computing, you need to buy software paying for it and you might need to upgrade your hardware so that the software is compatible with the system you use. But in cloud computing, instead of paying large amount to buy software, you often only pay a small subscription fee for usage of the software through the cloud. Sometimes there are also free versions of the software which can be used. Thus, the cloud computing is preferred often.

D. Scalability on demand

One of the biggest reasons for companies to move to the cloud is for scalability. For example, the space on your hard drive left is just 5GB and you need to copy a file to your hard disk which is of size 6GB. You need to buy a new drive if you do not want to lose some of your current data by deleting t. In cloud computing, instead of buying an extra hardware you upload your files so that they're all in one place to be used whenever needed. If you need more space, just upgrade for an increase in your on line storage for a fee.

E. Ubiquity

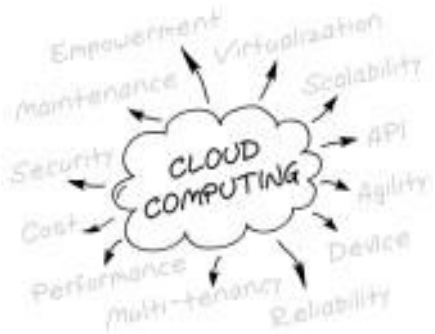
The "cloud" is everywhere. Any person can access the Internet from anywhere in the world. This means that the user can work from office or at home and have access to the same data or the software remotely over the Internet.

F. Safety

Safety is one of the most notable features of cloud computing. Consider your laptop where store your confidential data. Someone might hack in to it or use your laptop to access your data. But in cloud computing, your data is securely stored in a virtual server with high security by using fire walls to prevent unauthorized access.

Cloud Benefits

- Increased capability
- Improved performance
- Lower cost High availability
- Reduced risk
- Flexible scaling
- No infrastructure management complexity
- Increased capability
- Improved performance



What services can be used in the cloud?

There are numerous services that can be delivered through cloud computing, taking advantage of the distributed cloud model. Here are some brief descriptions of a few of the most popular cloud-based IT solutions:

Hosted Desktops

Hosted desktops remove the need for traditional desktop PCs in the office environment, and reduce the cost of providing the services that you need. A hosted desktop looks and behaves like a regular desktop PC, but the software and data customers use are housed in remote, highly secure data centres, rather than on their own machines. Users can simply access their hosted desktops via an internet connection from anywhere in the world, using either an existing PC or laptop or, for maximum cost efficiency, a specialised device called a thin client.

Hosted Email

As more organisations look for a secure, reliable email solution that will not cost the earth, they are increasingly turning to hosted Microsoft Exchange email plans. Using the world's premier email platform, this service lets organisations both large and small reap the benefits of using MS Exchange accounts without having to invest in the costly infrastructure themselves. Email is stored centrally on managed servers, providing redundancy and fast connectivity from any location. This allows users to access their email, calendar, contacts and shared files by a variety of means, including Outlook, Outlook Mobile Access (OMA) and Outlook Web Access (OWA).

Hosted Telephony (VOIP)

VOIP (Voice Over IP) is a means of carrying phone calls and services across digital internet networks. In terms of basic usage and functionality, VOIP is no different to traditional telephony, and a VOIP-enabled telephone works exactly like a 'normal' one, but it has distinct cost advantages. A hosted VOIP system replaces expensive phone systems, installation, handsets, BT lines and numbers with a simple, cost-efficient alternative that is available to use on a monthly subscription basis. Typically, a pre-configured handset just needs to be plugged into your broadband or office network to allow you to access features such as voicemail, IVR and more.

Cloud Storage

Cloud storage is growing in popularity due to the benefits it provides, such as simple, CapEx-free costs, anywhere access and the removal of the burden of in-house maintenance and management. It is basically the delivery of data storage as a service, from a third party provider, with access via the internet and billing calculated on capacity used in a certain period (e.g. per month).

Dynamic Servers

Dynamic servers are the next generation of server environment, replacing the conventional concept of the dedicated server. You can directly control the amount of processing power and space you use, meaning you don't have to pay for hardware you don't need. Typically, you can make changes to your dynamic server at any time, on the fly, without the costs associated with moving from one server to another.

What is the education with cloud computing?

In the field of education, cloud computing is very practical for a variety of reasons. It has already been implemented and is being used in various colleges across the world.

The students do not need extensive knowledge of the usage of cloud computing to use it for educational purposes. All they need is a smart phone or a computer with Internet connection which most of the

students have these days. With just these tolls, the students can benefit in various forms by using the technology of cloud computing.

How it is implemented?

Consider an example of our current education system where a lecturer from a remote location cannot teach the students in the class. To teach the students, the lecturer needs to be present in the class. Using the technology of cloud computing, the lecturer can provide lectures from a remote location. This can be used to pave the way towards seminars, lectures through the cloud. This is just one of the long list of applications that cloud computing provides in the field of education.

In college libraries, the students have to get the books and return it before the given date so that they can renew the book for a few more days without paying money. There is also a chance that the books a particular student needs might be out of stock in the library. With all these problems that might arise, cloud computing offers a better solution. The books in their digital form are stored in a virtual server which is affordable when compared to actually buying a server. An appropriate e-book reader is also stored in the virtual server for viewing purpose of the books. The students can view their books whenever and whenever they want with their smart phones or laptops. This provides convenience since the students need not renew their books often or worry about the books going out of the stock.

Cloud computing in the field of medicine

Cloud computing can be implemented in various fields in medicine>let us take a simple example of computers in many hospitals of a single town connected to a virtual server through the cloud where the doctors can contact other doctors from different hospitals.

A. communication

By extending the cloud communication between the hospitals of a single town to hospitals in different countries, it can be easily notified to every hospitals if there is new diseases and the treatment that should be given to cure the patient from the disease.

B. Faster access of information

Cloud computing can also help in easier access and distribution of patient information among doctors. A doctor can conducts tests such as blood tests in his lab and updates the results through a computer in the lab for the doctor in a separate wing of the hospital to see it and treat the patient accordingly.

C. Security and Privacy

Nowadays cloud services need to comply with security and privacy standards such as health Insurance Portability and accountability act (HIPAA). Nowadays, HIPAA is offered as a service by a lot of cloud service providers.

D. Portability

Usually in hospitals, information may be needed in two places or two separate wings of the same hospital at the same time. By using the technologies of cloud computing, this can be done in real time for sharing the data in a synchronized manner.

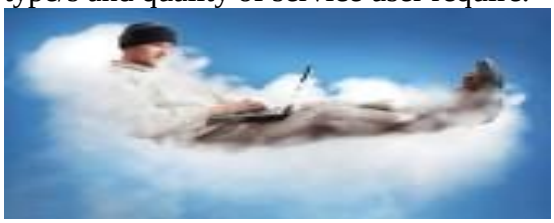
E. Remote access to information

Cloud computing technology can be used in the ambulances when they need to update information remotely instead of waiting to update the information of the patient until they get to the hospital.

7. CONCLUSION

When business grows, IT needs to grow.. The scalability and speed of deployment offered by cloud computing means IT provision can be extended instantly to meet increased requirements, and also scale it down again whenever user want. Security is typically greatly enhanced, along with resilience, and the flexibility and responsiveness of cloud-based IT services mean that user can react quickly to a changing business environment. Waste (of both time and resources) is reduced, allowing user to effectively do more with less. This provides user a leaner, more efficient IT model, available on demand.

Moving to a cloud computing model can help organization to survive in a tough economic climate, equipping youth the latest business tools and giving access to advanced technologies at a fraction of the cost of purchasing and running the same systems in-house. Service provider can deliver the type/s and quality of service user require.



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