Cloud Computing

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Abstract

Cloud computing is basically a resource that you can utilize online to maintain your business's platform while you worry about other basic assets about your business. It basically changes how online developers meet their criteria for their IT software. Cloud computing is always advancing and changing each year so that it will work better for personal uses and business uses. The three main Technology platform strategies that you will find taking advantage of the cloud computing strategies include, Platform as a Service: PaaS, Software as a Service: SaaS, and Infrastructure as a Service: IaaS. There are other services online that use cloud computer, but the three that are mentioned are just the main methods that are used. There are various tools and features that users will be able to track when using the cloud computing resource.

1. Introduction

Cloud Computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth. Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation.

A simple example of cloud computing is Yahoo email, Gmail, or Hotmail etc. All you need is just an internet connection and you can start sending emails. The server and email management software is all on the cloud (internet) and is totally managed by the cloud service provider Yahoo , Google etc. The consumer gets to use the software alone and enjoy the benefits.
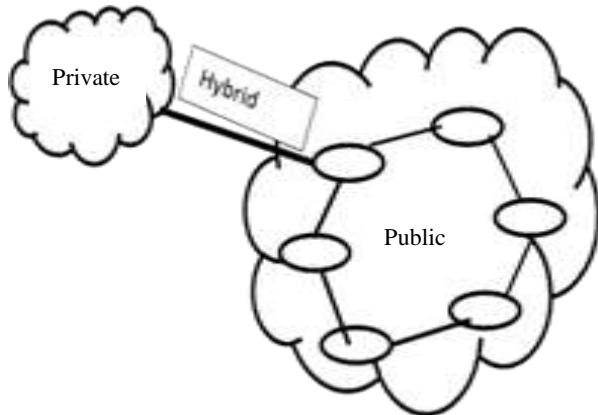
2. Cloud or Internet Computing

We can say that internet is worked as a cloud which has no end. That's why we can say it Internet computing. This computing has shape of computer so it is called cloud computing.
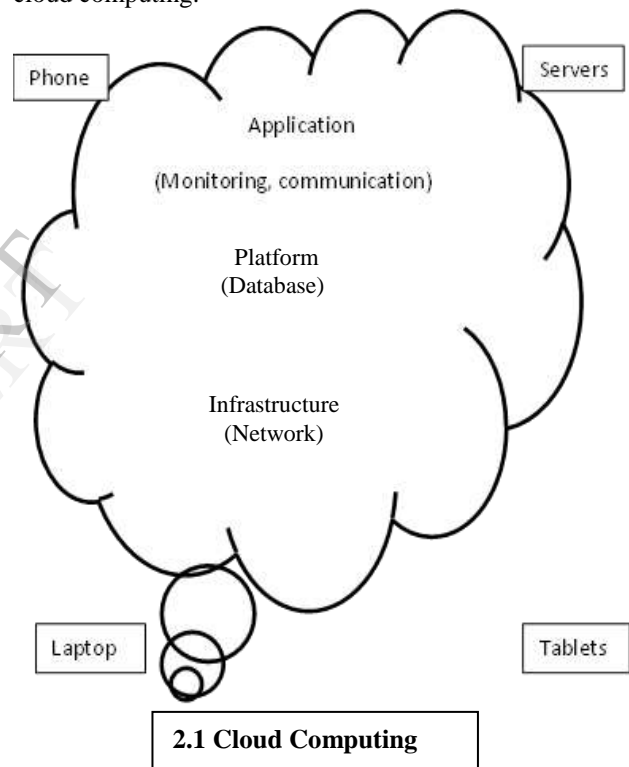
2.1 Cloud Computing

3. Types of Cloud Computing

We have 3 types of cloud computing:

A. Private Cloud Computing.
B. Public Cloud Computing
C. Hybrid Cloud Computing

3.1 Types of Cloud Computing

A. Private Cloud Computing: Private clouds are also known as Internal Cloud or corporate cloud. The computing infrastructure is dedicated to a particular organization and not shared with other organizations. Private cloud is a marketing term for a proprietary computing architecture that provides hosted services to a limited number of people

Marketing media that uses the words "private cloud" is designed to appeal to an organization that needs or wants more control over their data than they can get by using a third-party hosted service such as Amazon's Elastic Compute Cloud or Simple Storage Service.

Private clouds are more expensive and more secure when compared to public clouds. Benefits of private clouds are as follows:-
- cost reduction.
- enhancing service quality.
- reducing the time it takes to deliver what users demand.
- Highly secured.

B. Public Cloud: *Public cloud* is also known as *external cloud. Public cloud* describes cloud computing in the traditional mainstream sense. In Public cloud the computing infrastructure is hosted by the cloud vendor at the premises. The customer has no visibility and control over where the computing infrastructure is hosted. The computing infrastructure is shared between any organizations.

Public clouds are less secure as compare to private clouds and public clouds are very huge cloud. A public cloud is one based on the standard cloud computing model,

in which a service provider makes resources, such as applications and storage, available to the general public over the Internet. Public cloud services may be free or offered on a pay-per-usage model.
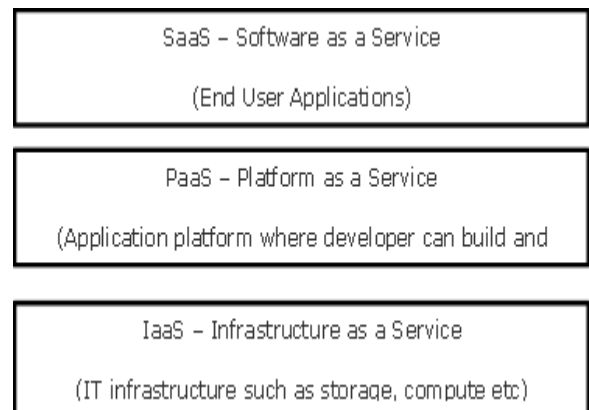
The main benefits of using a public cloud service are:

- Easy and inexpensive set-up.
- Scalability to meet needs.
- No wastage of resources.

C. Hybrid Cloud: A hybrid cloud is a composition of at least one private cloud and at least one public cloud. A hybrid cloud is typically offered in one of two ways: a vendor has a private cloud and forms a partnership with a public cloud provider, or a public cloud provider forms a partnership with a vendor that provides private cloud platforms.

According to the National Institute of Standards and Technology (NIST),**hybrid cloud computing solutions** are, *" the composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound*

4. Cloud Computing Service Model or Cloud layers

SaaS – Software as a Service
(End User Applications)

PaaS – Platform as a Service
(Application platform where developer can build and

IaaS – Infrastructure as a Service
(IT infrastructure such as storage, compute etc)

4.1 Layers or Service Model of Cloud

A. SaaS(Software as a service) :- SaaS is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network, typically the Internet. SaaS

eliminates the need to install and run applications on the customer's computers/servers and simplifies maintenance, upgrades and support. Application delivery is typically closer to a one-to-many model than to a one-to-one model. Examples of SaaS are Facebook etc.

Examples of common SaaS applications are:
- email accounts such as Hotmail or Google;
- CRM (customer relationship management) systems such as Salesforce;
- HRM (human resource management) such as Kenexa.

Important features of SaaS are:
- data can be added to the SaaS application;
- the software application can be accessed without needing to use additional hardware or software;
- data and the software application are hosted centrally.

B. PaaS(Platform as a Service) :- PaaS used by software development companies to run their software products. Software products need physical servers to run. PaaS provides all of the platform out of the box enabling software applications to be given to the platform which will execute them with no requirement for administration of the lower level components.

 PaaS refers to an environment for software development, storage and hosting delivered as-a-service over the Internet. It facilitates the development and deployment of applications without the cost and complexity of buying, managing and configuring the underlying hardware, middleware and software. Examples of PaaS are Google App Engine, Force.com, Microsoft Azure, WOLF, etc.

Features of PaaS:-
i. Services to develop, test, deploy, host and maintain applications in the same integrated development environment.
ii. Web-based user-interface creation tools.
iii. Support for development team collaboration.

Common PaaS applications are:-
i. Back end server development (e.g., Java/J2EE)
ii. Front end client development (e.g., Javascript/Dojo)
iii. Web site administration.

C. IaaS(Infrastructure as a Service) :- Infrastructure as a Service (IaaS) involves outsourcing the equipment used to support operations, including storage, hardware, servers and networking components. This covers a wide range of features, from individual servers, to private networks, disk drives, various long term storage devices as well as email servers, domain name servers as well as messaging systems. All of these can be provisioned on demand and often include software license fees for operating systems and associated software installed on the servers. Organisations can build a complete computing infrastructure using IaaS on demand.

IaaS providers may offer one or more of the following:
i. Computing, Storage and Bandwidth
ii. Development and Test
iii. High Performance Computing
iv. Resource Sharing

Common IaaS Applications:-
i. Email servers, SAP, enterprise content management
ii. Traditional RAID array with multiple disks, and storing
 dedicated single copy data as a backup on that array
iii. Documents stored on a file server and backed up to a tape drive.

5. Uses of Cloud Computing

5.1 Uses of Cloud Computing

A. Pay Per Use:-In cloud computing users will have to pay only for the amount of service used by them. This way, money spent on improving business through cloud doesn't prove to be expensive.

B. Always Available:- Its infrastructure is performance oriented. This cloud computing technology is always available. It provides

24*7 facilities to us means any time we can use it.

C. Optimization of resources:- Suppose your company is facing hard time in managing. Servers are running low and there is not enough space left for new data to be stored. To overcome such a situation, cloud services are introduced so that existing servers get rest from the over loaded traffic and work environment of the company becomes more synchronized.

D. Recovery:- For every successful cloud computing disaster recovery plan is must. Cloud disaster recovery plan works automatically at the time a server or data crashes and held in restoring at the earliest.

E. Cost Effective:- Cloud computing provides cost-effective business environment.Cloud promotes device independence, the cost of Hardware and software automatically cuts short. Although, the initial expense of deploying cloud architecture is there, but that also focuses on pay for what you use model.

F. Flexible:- The entire concept of cloud computing is divided into three forms of cloud. These include Public cloud, Private Cloud and Hybrid Cloud. All three have significant characteristics; however their choice depends on the personal requirements of businesses. So cloud commuting is flexible and according to need we can choose type of cloud computing.

G. Security, Risk management:- Cloud security concerns have raised many questions on its reliability, the technology is functioning at its rapids pace. All such factors give rise to a compliant business environment.

6. Benefits of Cloud Computing:

A. **Achieve economies of scale** –Cloud computing increases volume and output with fewer people.

B. **Reduce spending on technology infrastructure.** Maintain easy access to

information with minimal spending. Pay as you go based on demand.

C. **Globalize on the cheap.** People worldwide can access the cloud using Internet connection.

D. **Streamline processes.** Get more work done in less time with less people.

E. **Reduce capital costs.** There's no need to spend big money on hardware, software or licensing fees.

F. **Improve accessibility.** You have access anytime, anywhere, making your life so much easier!

G. **Monitor projects more effectively.** Stay within budget and ahead of completion cycle times.

H. **Less personnel training is needed.** It takes fewer people to do more work on a cloud, with a minimal learning curve on hardware and software issues.

I. **Minimize licensing new software.** Stretch and grow without the need to buy expensive software licenses or programs.

J. **Improve flexibility.** You can change direction without serious "people" or "financial" issues at stake.

7. Applications of Cloud Computing

A. Accounting*:*
It provides accounting and enterprise resource planning (ERP) package for small businesses. It's available on a SaaS basis from Phreebooks hosting partner UniMatrx.

B. Business Intelligence:
The first open source, software as a service, business intelligence solution, Palo's SaaS edition can help companies reduce their hardware, maintenance and installation costs. It offers planning, analysis and reporting capabilities that are a step up from using a spreadsheet application.

C. Cloud Infrastructure:
Backed by Nasa, Rackspace and many other notable technology companies, OpenStack is building two separate cloud technologies: Compute, which provides

the technology necessary to set up a cloud environment, and Object Storage for cloud-based storage. The goal is to develop standards that will promote interoperability among cloud offerings.

Hosting services
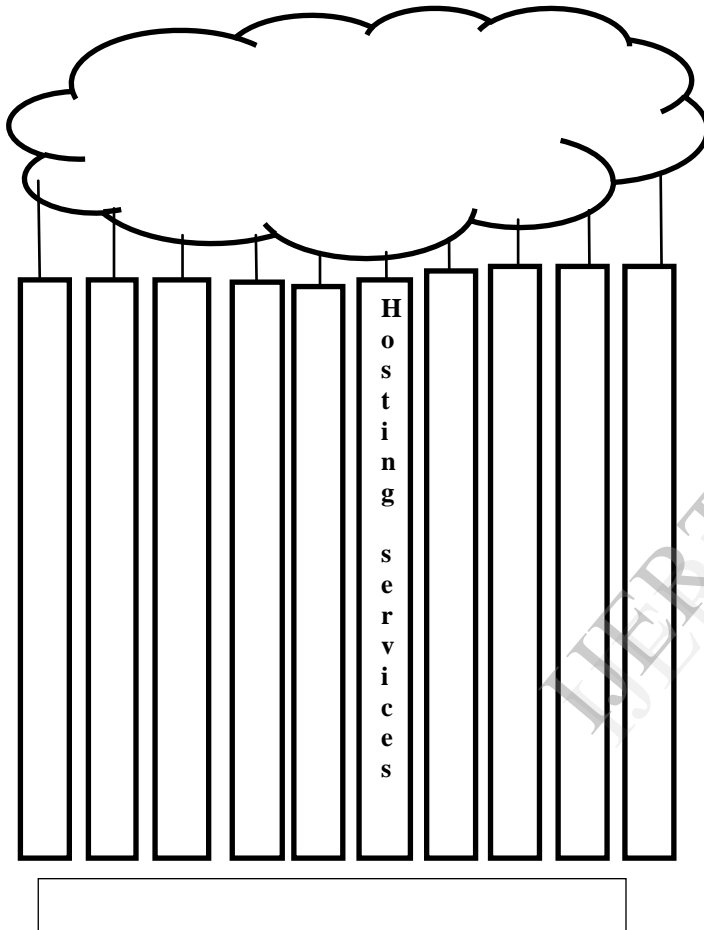
D. Customer Relationship Management (CRM):

An alternative to Salesforce.com, Sugar CRM, has an impressive client list, which includes Coca-Cola, Avis, H&R Block. Both the professional and enterprise editions are available on-site or on-demand.

E. Email/Collaboration/Groupware:

Positioning itself as an alternative to Microsoft Exchange, Zimbra offers cloud-based email and groupware functionality. It offers a wide array of editions and deployment options.

F. Hosting services

Amazon and their Infrastructure as a Service (IaaS) offering through their EC2 platform. But of course, Amazon is only one of the many players in this growing field, and in many cases, IaaS plays like EC2

are being pushed aside in deference to various Software as a Service (SaaS) plays, where clients surrender a certain amount of control over their operating system and runtime environment for the promise of fewer configuration issues and a lower administrative overhead. It's probably the most tried-and-true way of leveraging the cloud, and as such, more and more mobile applications are taking advantage of cloud-based hosting services.

G. Payment gateways:

Part of the reason that Apple and their iTunes store became so successful is the fact that their straightforward and easy-to-use payment system made it routine for the suppliers of iPhone and other iOS-based applications to become successful too.. Not surprisingly, several cloud-based providers of payment gateways have emerged, making it easy for application developers to perform financial transactions with their clients without the worry of lost sales due to reliability issues or software bugs.

H. Web analytics:

Highly focused nature of mobile applications allows developers to quickly turn Web analytics and the usage information they gather into product enhancements and application upgrades. In an effort to always be making their products better, more mobile applications are leaning on cloud-based services to capture, store and render information about users' interactions.

I. Application monitoring:

If everything is run in-house, how would you ever know if your system went down? When it comes to monitoring your mobile application's uptime globally, and having some type of reporting structure to conform to depending upon whether your system has been down for two seconds, two minutes or two hours, you need an external system to do it, and no one would be better to do it than a cloud provider with systems that are designed with reliability and failover in mind.

J. Development:

So much is said about the benefits of leveraging the cloud at runtime, but many organizations are still leery about full-scale deployment in the cloud and are instead slowly dipping their toes in the water by using the cloud for less mission-critical functions. Facilitating the interests of these cloud-exploring pioneers are cloud-based issues tracking systems, source code management systems, load testing tools and even full scale IDEs that take the desktop out of the equation when developers are writing code.

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