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Cloud Computing

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Abstract: ***The world of computer networks and information technology is evolving at an enormous rate. In which cloud computing is one of the few methods to provide users with the data, resources in a more efficient way. Cloud computing is seen as a more advanced version of computer grid inclusive of virtualization and resources sharing. Distributed computing over the internet is another new innovative technique using storage and the internet as one. "The Cloud" is an idea used to portray the virtual idea of advanced stockpiling, which can mean the information is put away on workers genuinely positioned in numerous geological areas. Cloud computing is the method for getting to a common pool of configurable assets that can be quickly given, utilized and delivered with insignificant exertion with respect to clients or specialist organizations. Cloud computing is arising at the combination of three significant patterns—administration direction, virtualization and normalization of storing through the Internet***

Keywords*: *SaaS, PaaS, Cloud Computing, Hybrid.

I. MOTIVATION

Motivation for writing this paper is an interest in this new technology of Cloud Computing. The opportunity to find out about another region of processing not canvassed in lectures.

II. INTRODUCTION

Cloud computing is sharing of the different services with the help of the internet. These services are inclusive of things like tools and applications like data storage, servers, database, networking and different software too.
Instead of storing files on a local CPU or in a specific hard drive, cloud-based capacity makes it possible to save them to a far-off information base or in simpler terms store them in a remote database.

III. FEATURES OF CLOUD COMPUTING

1) *Accessibility:* The potential of Cloud can be changed according to its usage and can be enhanced. It investigates the capacity use and permits the client to purchase additional Cloud storage if necessary for a limited quantity.
2) *On-Demand Self-Service:* It is one of the most important features of cloud computing as the user can incessantly keep the records server's uptime, capabilities, and network storage.
3) *Economical:* It is a one-time investment since the company (host) must purchase storage and only a portion of it can be shared by several entities, saving the host money on a monthly or annual basis. Just a small part of the money is spent on daily repairs and a few other small investments.
4) *Large Network Access:* The user can be provided with data in any remote location with just the help of the internet. These abilities are accessible everywhere in the organization and gotten to with the assistance of the web.

IV. HOW DOES IT WORK?

Cloud computing is mostly an application-based software infrastructure. To understand it working, It can be categorized into two parts:

1) *Front-End:* This is responsible for taking the input of data from the user using the cloud computing software.
2) *Back-End:* It is the foremost component that is responsible for the security of the data and information. It consists of servers and databases.

The main server distributes tasks with the help of pre-defined protocols. It uses a different software to ensure a smooth connection between devices linked together via cloud computing.
It is common practice for the cloud providers to maintain different copies of the data to attenuate the risk of data breach, data loss etc.

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V. CLOUD COMPUTING TYPES

Cloud computing is divided into three different types which are:

A. *Private Cloud*

These are mainly said to be working only for a single organization. Also known as corporate cloud provides better security specifications and details than the other types. It uses structure that is given by the organization itself. These are easily changeable according to the users. It can be further classified into-

1) Dedicated clouds (Cloud within another cloud),
2) Managed private clouds (Cloud managed by a third-party vendor).

a) Advantages:

- More efficient in order to meet unpredictable demands from the user side without giving up on the security details.
- It enables the IT department to assign and deliver on-demand IT services quickly.

b) Disadvantages

- In comparison to the other types this one is pretty costly and difficult to purchase.
- Only skilled people with extreme knowledge can use it easily so only a handful of people are able to make proper use of it.

B. *Public Cloud*

It is the most common practice in the cloud computing branch. In this all services are managed and delivered by the provide only and almost every cloud has the potential to become a public cloud through sharing his resources with the different parties through the web.

a) Advantages

- Almost no capital is required to deploy this type of cloud. So, it cuts out a major factor of investment.
- It is remotely accessible because it is spread throughout the organization.

b) Disadvantages

- It provides less security and information on the resources is shared throughout the organization.
- No client-side control on the data.

C. *Hybrid cloud*

This type of cloud computing consists of both private and public clouds.

It is a single service but created from different services. Those who are inside the organization can access the private cloud contents but public cloud members are given authority to access only a limited number of things.

a) Advantages

- It is a more strategic approach to deal with outside elements of the organization.
- More flexible to the idea of new and unpredictable changes.

b) Disadvantages

- More resources are wasted while switching from one type to another.
- Security always remains an issue as access control might be distorted.

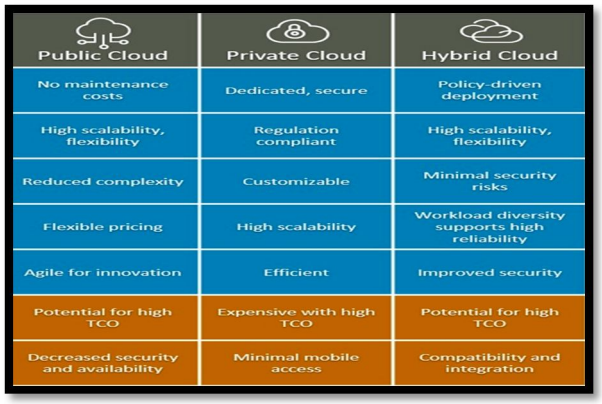

Fig 1. Cloud computing types

VI. CLOUD COMPUTING SERVICES TYPES

Cloud services can be further classified into: software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS).

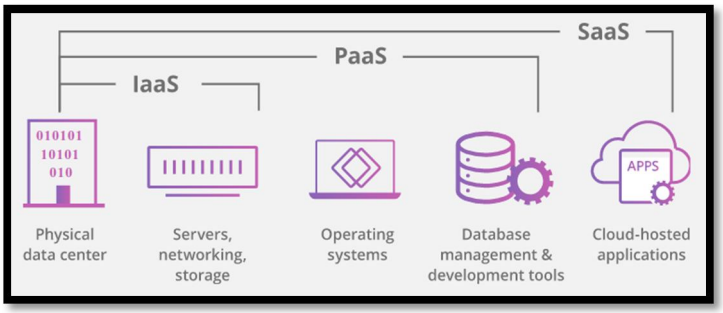

Fig 2. Cloud Computing Services Types

A. *Software-as-a-Service (SaaS)*

Also known as the "on-demand "software can be accessed through a web browser or an app. In this model services are provided by a company which we refer to as cloud service providers. End users can easily access these services without downloading any additional software's.

1) *Advantages of SaaS Model:* SaaS is not difficult to purchase SaaS valuing depends on a month-to-month expense or yearly charge membership, so it permits associations to get to business usefulness with ease.
2) *SaaS Needs Little Maintenance:* For companies, SaaS prevents the need for installation, routine maintenance and setup. SaaS has a lower initial setup cost than any enterprise software. As a result, SaaS is simple to track and update.
3) *Disadvantages of SaaS model*

- Absolute dependency on the internet Most SaaS software cannot be used without an internet connection.
- Idleness issue since information and applications are put away in the cloud at a variable location from the end-user, there is a likelihood that there might be more noteworthy inertness while connecting with the application

4) *Services Provided by SaaS are*

- Business Services- SaaS business services include ERP, CRM, billing, and sales.
- Document Management - SaaS document management is a software application offered by a third party (SaaS providers) to create, manage, and track electronic documents.

Some popular SaaS providers are Salesforce.com, Microsoft Office 365, and Google Apps etc.

B. *Platform-as-a-Service (PaaS)*

In the PaaS model, Users buy everything they need in accordance with their need for a specific time. The package mainly includes the development tools, infrastructure and operating systems. It also gives a runtime stage. In PaaS, back-end scalability is overseen by the cloud specialist co-op, so end-clients don't have to stress over dealing with the basic things.

1) *Advantages of PaaS model*

- PaaS has made development easier. Developers will work on growth and creativity instead of thinking about infrastructure management with PaaS.
- Instant community provided by PaaS because all of the communication is handled through the internet, online communication can be frequently provided by the vendors to share new ideas and all.

2) *Disadvantages of SaaS Model*

- Vendor dependency Because the vendor is the one with the knowledge of the tools and Operating system that is to be provided so without the vendor doing any work may seem next to impossible.
- Data Privacy: The external party aka vendor has almost all of the application's data. So, there is a risk involved in terms of data security.

3) *Services Provided by PaaS are*

- Databases such as MongoDB, ClearDB, PostgreSQL.
- Programming Languages like java, PHP, Go etc.

Some Popular PaaS providers are Appfof, Openshift etc.

C. Infrastructure-as-a-Service (IaaS)

Also known as Hardware-as-a-service is the layer that allows the end users to externalize their infrastructure such as networking, virtual machines, servers, storage etc. It is instant distributed and managed over the internet. It allows users to expand and shrink the resources according to their need.

1) Advantages of IaaS Model

- Pay-as-per-use model: It specifies that the user only has to pay for those services he has used.
- Increase stability, reliability and supportability: While using the IaaS model there is no need to manually upgrade and maintain the software or equipment problems. They provides checks that everything is meeting the necessary requirements.

2) Disadvantages of SaaS model

- Information exchanging issue: It is difficult to switch from one IaaS provider to another and It cannot be done at ease.
- Data Privacy: The IaaS provider does not provide 100 percent data security.

3) Services provided by PaaS are

- Networks such as bridges, routers for the Visitor management system.
- Computers include virtual main memory and virtual CPUs.

Some popular IaaS providers are Sify technology, Reliance communication etc.

VII. CONCLUSION

Let's sum up by saying that cloud computing is a relatively new technological advancement with huge potential for widespread impact. It has a wide range of benefits to offer both individuals and businesses. For instance, one benefit it provides to businesses is that it reduces operating costs by putting more of an emphasis on the business itself and spending less on maintenance and software upgrades. However, there are still other issues that cloud computing must address. Many people are unsure of how secure and confidential their data is. Data transmitted using cloud computing is not subject to local or international norms or legislation. Regarding who has access to and control over their data, users are likewise worried.

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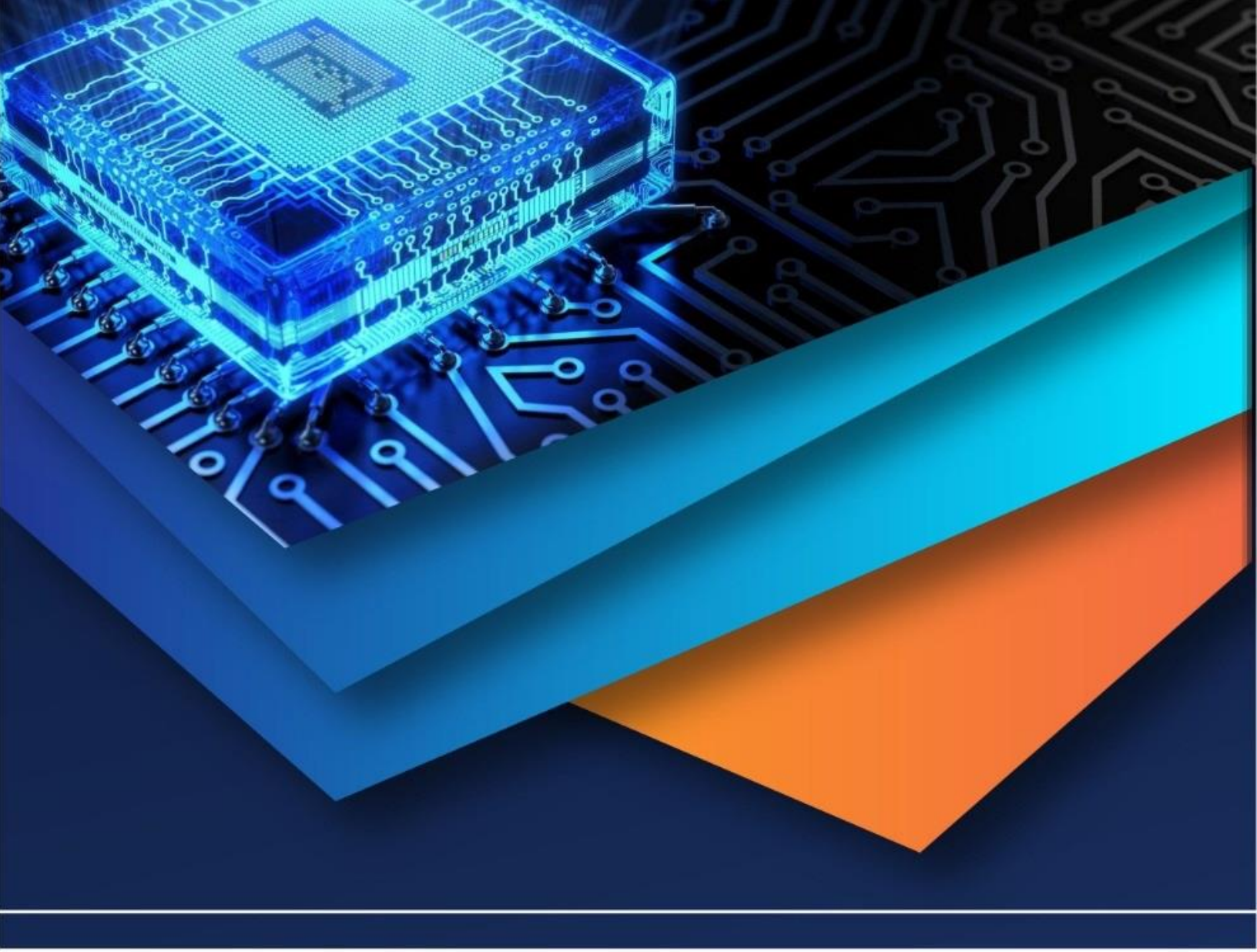

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