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Cloud Computing Services Advantages and Disadvantages

Anju Dhull
Assistant Professor in Computer Science, Govt. College Barwala (Pkl.)

Abstract: *Cloud computing is a technique continuously developing in the present world that has given various methods for storing and processing information on internet. It is a latest technology in which the user works on network without installing a single thing on his personal computer. In this way, Organizations can limit the use of their infrastructure with the help of cloud computing. IT organizations can use new techniques without any upkeep. Its main goal is to provide calculations, services and applications to public. This paper describes the main service forms of cloud computing. It emphasizes on the basic characteristics of cloud computing and its tremendous advantages. It also focuses on the drawbacks of cloud computing and what we can do to avoid them.*

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I. Introduction:

In the traditional model of computing, any organization must purchase hardware as well as software and staff to maintain their data and process it efficiently. It is also required to upgrade the hardware and software according to the requirement. It is very expensive for the users and some users are not able to afford all this. There is a requirement of some software which are provided to us for use on payment basis. This can be understood, like we take electricity from electricity department and we don't establish our own plant for electricity. Similarly, we take gas cylinders from the distributors and don't have our own plant. Similarly, if we get all the software and maintenance of our data without having our own software infrastructure then it looks very promising. Cloud computing is introduced by the companies in the following order.

Company	Focus	Launch Year
AWS	IaaS pioneer	2006
Salesforce	SaaS pioneer	1999–2000
Azure	Enterprise IaaS/PaaS	2010
GCP	Big Data, Kubernetes, AI	2008
Alibaba Cloud	Asia-Pacific, scalable infra	2009
IBM Cloud	Hybrid, AI, Red Hat integration	2011
Oracle Cloud	Enterprise DBaaS	2016
Digital Ocean	Developer VMs, simplicity	2011
Heroku	Easy app deployment (PaaS)	2007
Cloudflare / Fastly	Edge & CDN, serverless at edge	2009/2011

Reference:- https://www.google.com/search

Cloud computing is an emerging distributed computing model that promises to offer cost-effective, scalable and on demand services to users, without the need for large infrastructure investments. One of the main reasons for the success of cloud computing is the role it has played in eliminating the size of an enterprise as a critical factor in its economic success.

Types of Clouds:- The Cloud computing comes in three main types:- Public Cloud, Private Cloud and Hybrid Cloud. Businesses can choose to deploy services on Public, Private, Hybrid Cloud and Community Cloud.

PUBLIC CLOUDS:-

Public clouds are owned and operated by companies that use them to offer rapid access to affordable computing resources to other organizations or individuals. With public cloud services, users don't need to purchase hardware, software or supporting infrastructure, which is owned and
managed by providers. Public clouds are made available to the general public by a service provider who hosts the cloud infrastructure. Examples of public clouds include Amazon Elastic Compute Cloud (EC2), IBM's Blue Cloud, Sun Cloud, Google App Engine and Windows Azure Services
Platform. A public cloud is the obvious choice when:

- Your standardized workload for applications is used by
- lots of people, such as e-mail.
- You need to test and develop application code.
- You need incremental capacity.
- You're doing collaboration projects.

PRIVATE CLOUDS:-

Private clouds are data center architectures owned by a particular organization that provides flexibility, scalability, provisioning, automation and monitoring. The goal of a private cloud is not sell "as-a-service" offerings to external customers but instead to gain the benefits of cloud architecture without giving up the control of maintaining your own data center. Private clouds are more expensive but also more secure when compared to public clouds. Private cloud is needed in the following cases:

- You need data sovereignty but want cloud efficiencies
- You want consistency across services
- Your data center must become more efficient
- You want to provide private cloud services

HYBRID CLOUDS:-

Hybrid Clouds are a composition of two or more clouds (private, community or public) that remain unique entities but are bound together offering the advantages of multiple deployment models. In a hybrid cloud, you can control third party cloud providers in either a full or partial manner; increasing the flexibility of computing. For instance during peak periods individual applications, or portions of applications can be migrated to the Public Cloud. Here are situations where a hybrid environment is suitable:

- Your company wants to use a SaaS application but is concerned about security.
- Your company offers services that are tailored for different vertical markets.
- You can provide public cloud to your customers while
- using a private cloud for internal IT.

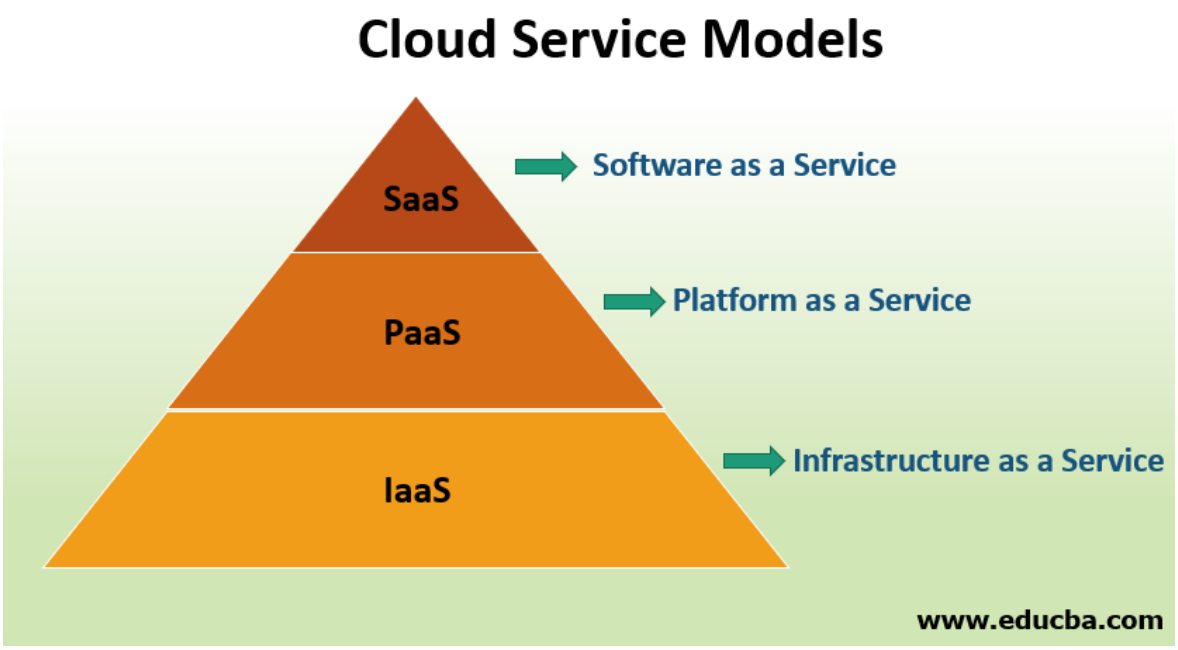
COMMUNITY CLOUDS:-

A Community Cloud is designed to meet the needs of a community. Such communities involve people or organization that has shared interests. This includes industrial groups, research groups, standards groups, and so on. Community clouds are a hybrid form of private clouds built and operated specifically for a targeted group. These communities have similar cloud requirements and their ultimate goal is to work together to achieve their business objectives. The goal of these clouds is to have participating organizations realize the benefits of a public cloud with the added level of privacy, security, and policy compliance usually associated with a private cloud. Situations where a community cloud is best:

- Government organizations within a state that need to share resources
- A private HIPAA compliant cloud for a group of hospitals or clinics
- Telco community cloud for Telco DR to meet specific FCC regulations

Service Forms of Cloud Computing:- All the Cloud types offers different form of services which are classified as follows.

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)



Reference: https://www.google.com/search

Infrastructure as a Service (IaaS): In this cloud service model the service provider hosts all the required necessary hardware and the Internet connectivity link. The useronly share responsibility for the virtual machine hosted on this hardware and the software's(include operating system) which runs on it. As shown in figure 1, this is the last / bottom layer and the software applications run on it. This service provides on demand infrastructure which is storage, computing, networking, management and support components (virtual servers). This infrastructure is accessed via Internet, enabling organisations to move their data to cloud. Resulting in to dissolve or dismantling there in house data centers. Each of these services can be deployed by organizations or individuals either as a private, public, hybrid and community cloud.

Platform as a Service (PaaS): In this cloud service model the user supplies the application they wish to deploy, and the cloud service provider supplies all the components required to run this application which is also called as application hosting. As shown in the figure 1, this is the middle layer between SaaS and IaaS. It provides operating systems and application development platform which can be accessed and utilized via the Internet. Developers use this platform to develop, test, deploy and host web applications as a service via the internet. E.g. providers of such platforms as a service are Google Application Engine, Microsoft Windows Azure and International Business Machine (IBM).

Software as a Service (SaaS): In this cloud service model the service provider supplies the software application and all the components required for its execution. SaaS is designed to be a turnkey solution for the customers. Many web-ERP software solutions are hosted on the SaaS cloud and provide accounting and business Information to the user or customer. As shown in the figure 1, this is the top-most layer of cloud computing. This layer involves applications such as text processors, video editors and databases to be hosted by cloud service provider and is made readily available to the users on demand via Internet. Few examples of software as a service includes customer relation management (CRM), email messaging, Google Document (Doc) etc.

Characteristics Of Cloud Computing:- Basically Cloud Computing has five features which are as follows:

1. **On-demand self-service:** Cloud services such as server time, storage, web applications, computing power, and networks may be delivered automatically to consumers as needed, eliminating the need for human interaction.

2. **Resource pooling**: Cloud providers pool their computing resources together to accommodate multiple customers. This is accomplished either through virtualization, which uses virtual machines to replicate physical hardware or through "multi-tenancy," which allows multiple users of the same resources. This is made possible by having various physical and virtual resources that are dynamically assigned and reassigned in response to changing consumer demand . The concept of a pool-oriented computing paradigm is inspired by economies of scale and resource specialization. Physical computing resources have resulted in this community paradigm. It

suggests that the customers are unaware of the available resources. Consumers are oblivious to the origins, location, and physical composition of the resources they utilize. Customers are unable to identify the place in certain clouds where their data is supposed to be kept. This enables resource pooling without exposing the resource provider's management structure and allows for fully flexible resource offering to clients.

3. Broad network access:- Numerous clients (applications) that access the required computer resources through a network, mostly the internet, employ a range of platforms, including laptops, microcomputers, and mobile phones, all of which are present at the consumer's end. The benefits of cloud computing can be expanded thanks to broadband network connectivity.

4. Rapid elasticity:- Numerous clients (applications) that access the required computer resources through a network, mostly the internet, employ a range of platforms, including laptops, microcomputers, and mobile phones, all of which are present at the consumer's end. The benefits of cloud computing can be expanded thanks to broadband network connectivity. Numerous clients (applications) that access the required computer resources through a network, mostly the internet, employ a range of platforms, including laptops, microcomputers, and mobile phones, all of which are present at the consumer's end. The benefits of cloud computing can be expanded thanks to broadband network connectivity.

5. Measured service:- In a cloud environment, multiple users may share computer resources (multi-tenancy), but the cloud infrastructure may make use of tools to monitor how each user is using these resources. The cloud computing metering methods enable for the individual invoicing of numerous cloud users.

Cloud Computing Disadvantages:- Cloud computing results in various drawbacks and dangers to the data of the users. These disadvantages are to be managed in order to use cloud computing environment.

1. Security and privacy :- These include the organizational and technical difficulties of maintaining a sufficient level of data privacy and security in cloud services. This guarantees that serious security and privacy problems about the security and privacy of crucial or sensitive data for a business, like banks, arise when government entities use the cloud. Although it is widely accepted that service level agreements between cloud service providers and customers are required, there are currently no formal safety requirements. Things like machine detection, side-channel assaults, encryption, and authentication are among the data security and privacy issues.

2. Interoperability and portability:- Service portability between different cloud providers is leading to several issues. Due to the lack of defined formats and interfaces for managing virtual appliances and uniform interfaces for interacting with different clouds, this issue exists. There is currently no standard way to communicate with clouds. Instead, many cloud providers present various APIs. Standardizing APIs among the many cloud service providers is necessary to develop a common cloud interface.

3. Legal issues:-The use of cloud resources as a utility has raised numerous legal concerns.Data placement is the primary problem.Different regions and jurisdictions have very different laws and regulations regarding where,how,and how long data should be stored.Regarding the disclosure of data in general and sensitive data in particular for instance data from financial and health sector.,compliance requirements may differ.In addition to the issues of identity definition, such as users versus system and issues of authentication and authorization.,another significant issue is the absence of comprehensive legislation on liability in the cloud.

4. Economic Challenges: - The cost of the physical infrastructure and the administrative costs connected to it are essential in determining the viability of the business from an economic perspective.. This issue has to do with the cost-benefit element of cloud computing. Cloud service companies must develop efficient monetization plans that will yield a respectable return on their efforts. The plan calls for developing viable pricing structures, implementing licensing plans, and grouping resources. Since diverse providers handle invoicing and payments, it might be difficult to ascertain the type, caliber, and availability of services that the consumer is paying for. Financial benchmarking and evaluation of various providers are therefore challenging.

5. Data Management:- Due to the increased data-intensive applications that cloud computing enables at the largest scale, there is an increased need for efficient data management solutions. Data storage falls under this heading..Data segmentation, recovery, location, authenticity, anonymization, and backup are all parts of data. Data retrieval and processing are additional problems with cloud computing across different data centers.

6. Service Management:- Service management faced various difficulties with the cloud-based IT strategy. The capacity to offer individualized and more context-sensitive services present another difficulty. For a variety of reasons, managing the service life cycle and service registry has proven to be difficult.

7. Quality:- The fundamental problem in the field of cloud service quality is the design and implementation of service level agreements.. Lack of a service-level contract between cloud firms makes adoption of cloud computing more difficult since it impacts user confidence in the dependability and availability of services. Negotiation and benchmarking are challenging due to the lack of a clear set of service level targets and quality of service assessments. The quality of the user experience, especially in multimedia, streaming video, and online gaming.

II. Conclusion:

In this research, we discussed the architecture, types, characteristics of cloud computing is key in information technology as it reduces cost for organizations and makes it easier to access files. It also helps to reduce data delay and redundancy. Any organization that wants to adopt cloud computing should consider the key challenges which is security and privacy.

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