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Era of Cloud Computing

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Abstract: *Cloud computing is a new field in internet computing. It is a popular enterprise model in which computing resources are made available on demand to the user as needed. It raises issues in the architectures, design through cloud computing. We can access anything from anywhere without worrying about anything like format incompatibility, storage, cost etc. This paper explore certain benefits of cloud computing. It also includes clouds services, models, challenges and security issues in cloud computing.*

Keywords: *Cloud Computing, Cloud Services, Scalability, Security Issues.*

1. Introduction

Cloud Computing is a new class of network based computing that takes place over the Internet. Users move data and applications to the remote called **"Cloud"** access data from the cloud in a simple and pervasive way. The platform provides on demand services that are always on anywhere, anytime and anyplace.

Cloud computing is the delivery of computing services over the Internet. Cloud Services allow individuals and businesses to use software and hardware that are managed by third parties at remote locations. It gives users self-service access to computing resources, Cloud computing relies on sharing of various resources (e.g., networks, servers, storage, applications, and services) to achieve coherence and economies of scale, and gives the highest interest to how to maximize the effectiveness of utilization of the shared resources.

The cloud can be both software and infrastructure. It can be an application you access through the Web or a server like Gmail and it can be also an IT infrastructure that can be used as per user's request. Whether a service is software or hardware, the following is a simple test to determine whether that service is a *cloud service:*
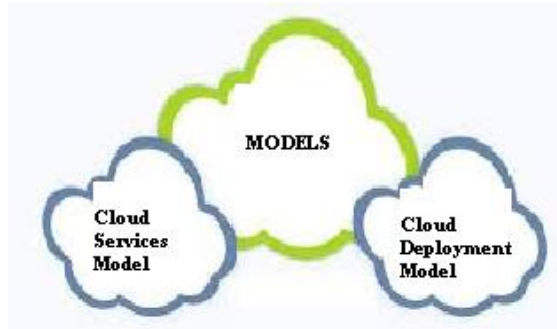
If you can walk into any place and sit down at any computer without preference for operating system or browser and access a service, that service is cloud-based. Generally, there are three measures used to decide whether a particular service

is a cloud service or not:

- The service is accessible via a web browser or web services API.
- Zero capital expenditure is necessary to get started.
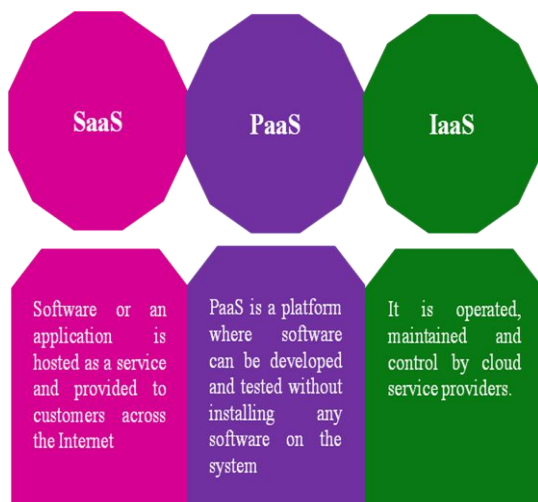- You pay only for what you use.

2. Cloud Architecture

Cloud computing offers an innovative business model for organizations to adopt IT services without upfront investment. There are two basic cloud models are discussed, first the ***Cloud service model*** and the second ***Cloud Deployment model***.
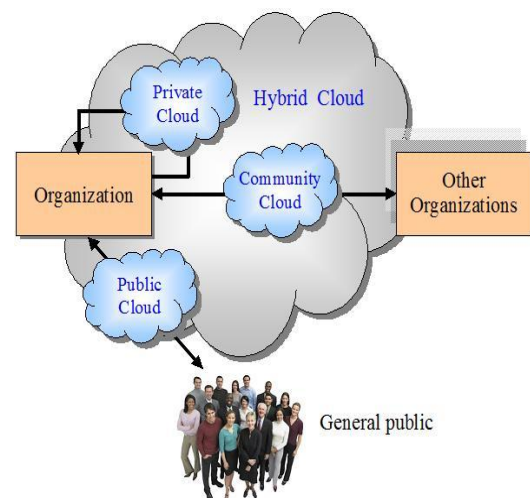
2.1 Cloud service Model:

- **Infrastructure as a Service (IaaS):** It is operated, maintained and control by cloud service providers that support various operations like storage, hardware, servers and networking.

- **Platform as a Service(PaaS):** It is a tool (Windows, LINUX) used by developers for developing Websites without installing any software on the system, it is a paradigm for delivering operating system and associated services over the internet without download or installation. Benefits for using Platform-as-a-Service include streamlined version deployment and the ability to change or upgrade and minimize expensive. One popular Platform-as-a-Service is the Google app engine.

- **Software as a Service (SaaS):** This is the final layer of cloud service model. In this model, a complete application is offered to the customer, as a service on demand. Today SaaS is offered by companies such as Google, Salesforce, Microsoft, Zoho; etc Software-as-a-Service provides complete applications to a cloud's end user. It is mainly accessed through a web portal and service oriented architectures based on web service technologies.

Cloud service Model

2.2 Cloud Deployment Model:

- **Private Cloud:** private cloud is build specifically to provide the services within an organization for maintaining the security and privacy.

- **Public Cloud:** it is for the general public where resources, web applications, web services are provided over the internet and any user can get the services from the cloud,.

- **Community Cloud:** A community cloud is controlled and used by a group of Organizations that have shared interests, such as specific security requirements or a common mission. The members of the community share access to the data and applications in the cloud.

- **Hybrid Cloud:** The Cloud is a combination of two or more clouds (public, private and community). Basically it is an environment in which multiple internal or external suppliers of cloud services are used. The Hybrid cloud environment is capable of providing on-demand, externally provisioned scale.

Cloud Deployment Model

3. Benefits

- **Disaster Recovery:** Businesses which used the cloud were able to resolve issues nearly four times faster than businesses that didn't use the cloud. Secure sockets Layer (SSL) is widely used and trusted this allow customers to reach their application securely without having to employ complex back-end configurations. Like virtual Private networks (vpns).

- **Easier collaboration:** Cloud computing increases collaboration by allowing all

employees – wherever they are – to sync up and work on documents and shared apps simultaneously easy for you to share your records with your advisers (e.g. a quick and secure way to share accounting records with your accountant or financial adviser).

- **Location Independent:** As long as employees have internet access, they can work from anywhere. This flexibility positively affects knowledge workers' work-life balance and productivity.

- **Automatic Software Updates:** Depending on your cloud computing service provider, your system will regularly be updated with the latest technology. This could include up-to-date versions of software, as well as upgrades to servers and computer processing power.

4. Factors and challenges:

- **Privacy and Security:** Computing resources has introduced new security challenges that require techniques to tackle with. The main challenge to cloud computing is how it addresses the security and privacy concerns of businesses thinking of adopting it. The fact that the valuable enterprise data will reside outside the corporate firewall raises serious concerns. Hacking and various attacks to cloud infrastructure would affect multiple clients even if only one site is attacked.

- **Costing Model:** Businesses can save money on hardware but they have to spend more for the bandwidth. This can be a low cost for smaller applications but can be significantly high for the data–intensive applications. Delivering intensive and complex data over the network requires sufficient bandwidth. Because of this, many businesses are waiting for a reduced cost before switching to the cloud. This problem is prominent where data is distributed amongst a number of public / private / community clouds.

- **Lack of Standards:** Clouds have documented interfaces and however, no standards are associated with these.

- **Data Protection:** There is fear of losing data and the confidentiality of data. Data protection in cloud computing is very important factor it could be complicated for the cloud customer to efficiently check the behavior of the cloud supplier and as a result he is confident that data is handled in a legal way, but it does not like

that this problem is intensify in case of various transformation of data. Counter measure for this attack is that a consumer of cloud computing should check data handle either it is handled lawfully or not.

5. Security Issues:

- **Difficult to Migrate:** It's not very easy to move the applications from an enterprise to cloud computing environment or even within different cloud computing platforms. Within the enterprise boundaries, data transmission usually does not require encryption, or just have a simple data encryption measure. For data transmission across enterprise boundaries, both data confidentiality and integrity should be ensured in order to prevent data from being tapped and tampered with by unauthorized users.

- **Internet Dependency:** Cloud computing services relies fully on the availability, speed, quality and performance of internet

- **Downtime and service level:** Every minute of downtime is a minute in which business application can't be performed which degrades the performance of organization. it also decrease the service level of the organization. it is necessary for customers to obtain guarantees from providers on service delivery. Typically, these are provided through Service Level Agreements

- **Incomplete Data deletion:** Incomplete data deletion is too much risky in cloud computing, it does not remove completed data because replica's of data is placed in other servers. Accurate data deletion is not possible because copies of data are stored in the nearest replica but are not available

6. Conclusion:

Cloud Computing is the fastest growing part of network based computing. It provides tremendous benefits to customers of all sizes: Simple users, Developers, Enterprises and all types of organizations. There are also privacy and security concerns. Cloud platforms aren't yet at the center of most people's attention. Vendor or an end user expects the cloud to play an increasing role in your future. The next generation of application platforms is here.

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