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Cloud Computing Challenges

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Abstract: ***Cloud computing is a set of Information Technology services that are provided to a customer over a network on a leased basis and with the ability to scale up or down their service requirements. Cloud computing is a new general purpose internet-based technology through which information is stored in servers and provided as a service and on-demand to the clients. It builds on decades of research in virtualization, distributed computing, utility computing, and more recently networking, web and software services.***

Keywords: cloud computing

1. Introduction

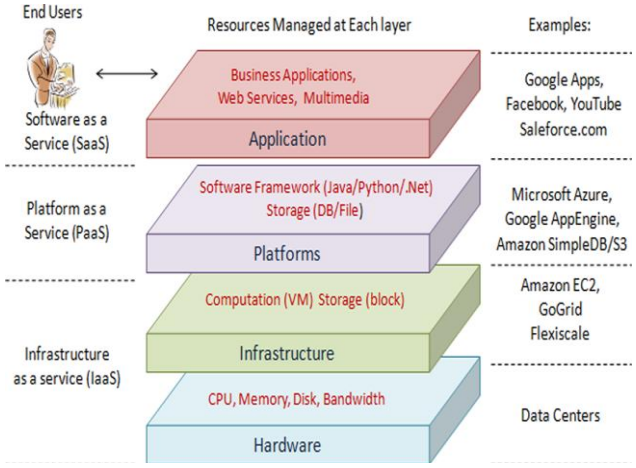
The term "cloud computing" has become popular and trendy, but there are many concepts behind this idea. On a general level, "cloud" is used as a metaphor for the "ethereal Internet" and the virtual platform that it provides. Some view cloud computing abstractly as the result of the convergence of computing and communications, or more practically as a "scalable network of servers," as "IT as a service," or as the convenience of being able to access a shared pool of computing resources over a network like the World Wide Web.

The success and growth of the Internet is affected in all aspects of our lives, including interactions, learning, and business. Many companies and organizations offer their services through the Internet. A cloud introduces an IT environment, which is invented for the motive of remotely provisioning measured and scalable resources.

Cloud computing is an advanced technique, which provides various online, computing resources as well as storage. Cloud computing permits a large number of users to access virtualized, scalable, distributed hardware and software resources via the internet.

National Institute of Standards and Technology in America (NIST) has defined cloud computing as follows: cloud computing is a model for universal access and based on the order, which is a set of changeable and configuration allowed computing resources, including networks, storage spaces, servers, applications and services (that can provide service with the least working and without the direct involvement of providers). [1]

2. Cloud Computing: A Variety Of Services



1) **Public cloud**: this is just as a shared cloud. Like services that are on the internet, without much control over their infrastructure. Public clouds are generally inexpensive, and may be submitted for testing and new product development of a company.
2) **Private cloud**: a private cloud can be called internal cloud. Private cloud provides a series of activities and functions. The clouds are extended in the data center or intranet levels of a company. It provides a private product or service to a company or enhanced security organization with fault tolerance.
3) **Hybrid clouds**: these clouds are a combination of public and private clouds. Roll and personal policies will control the security space and infrastructure of a system.
4) **Software as a service (SaaS)**: it refers to the user remote access to a product or service via the Internet. It is the most common model that users have been working with some of them. SaaS which is also called software on demand is software that has been developed on the internet, and users can use it for free or in return for payment.[2]
5) **Platform as a service (PaaS)**: in this service, instead of using software, platform is used as a service. With PaaS, software can be expanded without the cost of complexity in purchasing, and management of hardware and basic software, and also providing hosting services, and software developers don't need to spend development costs to create new applications or development of pervious programs.[3]

6) **Infrastructure as a service (IaaS)**: this service allows developers to interact with the server infrastructure. The ability to control hardware and software via the internet, control the operating system, disk storage, databases are some of facilities of this service.[3]

3. Challenge in Cloud Computing

There are many challenges in the field of cloud computing, thus it is necessary that in these cases we are aware of some of these challenges. The main challenges can be found below[4], [5]:

- **Privileged User Access**: if critical information of any customer which must be approved to subscribe to different companies is available, there is the risk of data leakage.
- **Availability**: many users and customers need access to cloud services at any time, which many companies providing cloud services are not available at any time.
- **Regulatory Compliance**: cloud service providers do not allow foreign inspection, and also be willing to install new security certificates.
- **Data Location**: when the user makes use of cloud computing services, don't realize this issue that data is stored on which place, and the service is located in what place.
- **Investigative Support**: if with the customer data stored, inappropriate and illegal activities take place in servers of the cloud computing providers, keep track of these things is impossible.
- **Data segregation**: in cloud computing, users' data are jointly available to other customers, who use the services of these providers.
- **Recovery**: if the server or data center of these service providers as a result of some natural or unnatural problems is lost, a provider of cloud services informs them.

4. Principles of Data Security

The three basic principles of confidentiality, availability, integrity are used in all data security techniques. Confidentiality means that information be available only when people need. The principle of confidentiality means that the data is available only to authorized persons and when needed. Data integrity is important in compliance with the laws governing data integrity and should guarantee high-quality, accuracy, consistence and accessible data. The principle of availability means that, information should be made available when the authorized persons need it. According to the analysis conducted, nine key principles for data security are achieved, which are mentioned below:[6], [7], [8]

- The openness, transparency
- Integrity, license, power
- Minimization
- Precision
- Security guards
- Accept
- Purpose
- Limiting the use by disclosure and retention Responsibility

5. Conclusion

Cloud computing is the demand to access a shared pool of computing resources. If the cloud technology is used in an appropriate manner, it would lead to reduce costs, reduce management responsibilities, and increase agility together with organization efficiency.

Cloud storage is one of the most popular services offered by cloud service providers to store customer data on a remote server.

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