

Role of Cloud Computing in well-being of Human Life

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Abstract: In the present world the demand of Internet is increasing day by day. With this increased demand the high amount of data storage facility is also required. As Internet is used for various purposes but one of the most significant usages of Internet is to transfer data at high speed, no matter what the distance is. It is very inconvenient to carry data storage devices each and every place for keeping the data readily available and secure. But at present we have a technology known, as Cloud computing which is an Internet based computing that can be used for providing data resources to computers or any other devices on-demand. This technology has played a very significant role in reducing the hardware cost of data storage and saving lot of space as well. In this paper we will discuss about Cloud Computing and its advantages.

Keywords: Cloud Computing, Internet, Data, On-demand,

1. Introduction

Cloud computing is defined as Internet based data storage technology, which uses Internet to save data online and provides data to the user whenever required. This is also known as On-demand Computing. This model enables an On-demand access to the information resources stored online. This information can be used and utilized anywhere, whenever required by the user but with the use of Internet. As all these data resources are stored online. Cloud Computing provides elasticity to a great extent which let companies to scale up and down the need of computing as per the demand. It is also very economical also as it follows pay per usage, which allows users to pay only for the data that they have consumed. Cloud Computing is a very cost efficient technology as it has a great potential of reducing waste, increases efficiency of the data centers and operational cost is also very less [1]. As car requires petrol for moving similarly In Cloud Computing Internet is the basic requirement. This is a very reliable and very convenient for a user to store and use data in third party data centers. As applications are hosted in the cloud, users and employees can access the information from anywhere provided they have an active Internet connection. To a great extent it is reliable on sharing of data resources to achieve a unified coherence. Cloud computing like an configurable shared pool of servers, networks, hardware devices, database etc. Cloud computing is like an electricity Grid, which is shown in figure 1.

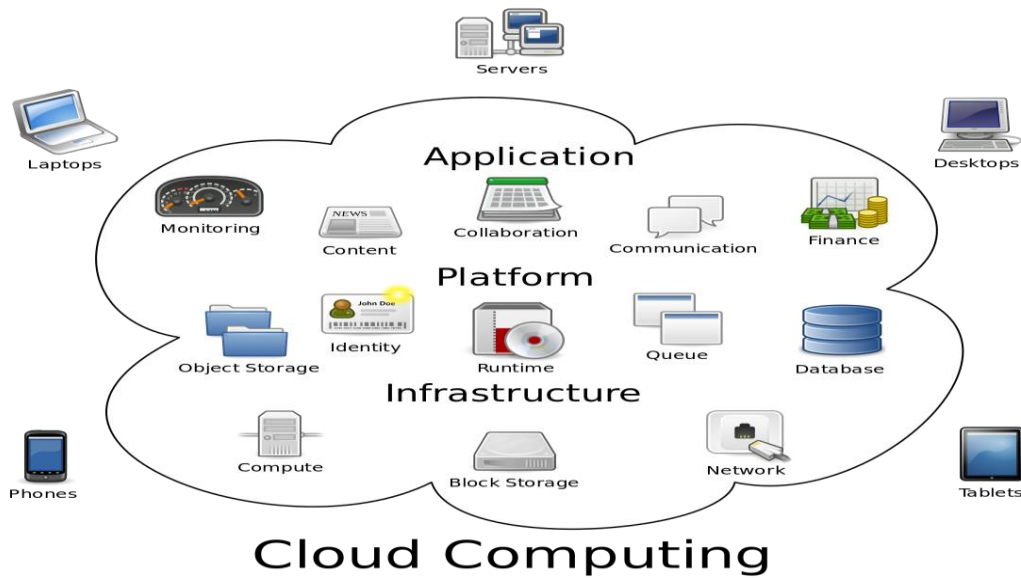


Figure 1: Cloud computing configuration

Some of the ways in which cloud computing can save money are stated below:

- Cloud Computing helps in increasing the service life of computers as it stores the data online, keeping the computer storage free. Which lets the processing of data by computer speedy and efficiently.
- Cloud Computing is an online On-demand technology, which let companies, to work freely without hiring in-house IT staff. As the data is totally hosted online, via cloud so the company won't require a big working area as employees can work from outside of the company premises also.
- As Cloud Computing is an online On-demand technology, so it won't require much servers on premises which reduces the set-up cost and provides much vacant space [2].

2. Working

Computer has become a necessity in present world. Every sector whether it is government, private or public, needs computers for storing and computation of data. With the advancement in technology, the devices used for storing information are becoming compact but the storage capacities are increasing [3]. Cloud computing provide service through service oriented architecture (SOA), which is generally known as EaaS (Everything as a Service). It is an architectural pattern in software design of computer, in which application components provide services to other components via a communications protocol, typically over a network. Cloud Computing provides services according to some models, which are organized in a stack, and works accordingly such as IaaS, PaaS and SaaS.

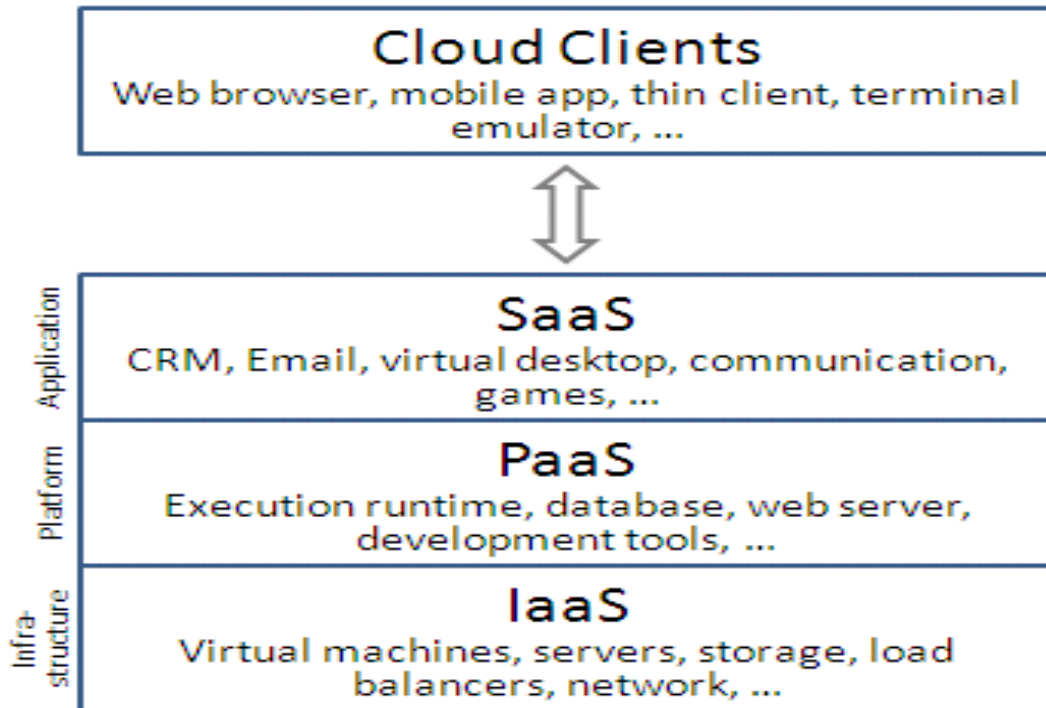


Figure 2: Cloud computing models

- **IaaS** defined as Infrastructure as a Service, which is the first component in the stack. It also offers Virtual or Physical machines – Computers. Services such as security, location, computing resources, data partitioning, scaling etc. are online services that abstract user from the detail of infrastructure are provided by IaaS. Virtual machines are run as guests by a hypervisor such as Oracle VirtualBox, Xen, KVM, Hyper-V or VMware ESX/ESXi. Large number Virtual machines can be supported by pools of hypervisors within the cloud operational system which has the ability to scale services down and up as per the customers requirements. A cloud of IaaS offers some additional resources such as firewalls, raw block storage, disk-image library, virtual local area networks or VLANs. Resources are supplied On-demand by IaaS cloud providers which are stored in their large pools of equipment installed in data centers. In IaaS the cost of the data is calculated on the basis of resources allocated and consumed.
- **PaaS** defined as Platform as a Service. It is a platform, which provides developers an environment to develop software applications operating system, programming-language execution environment, database, and web server. In this the provider develops all the required applications starting from toolkit to payment gateway including standards for development and channels for distribution. This is best platform for application developers for development and execution of the software without spending on cost of hardware and software layers. Example of PaaS is Google App Engine and Microsoft Azure [4].
- **SaaS** defined as Software as a Service. In application software and database, the users have access to both of them. The infrastructure and platforms that run the applications are managed by the Cloud providers. This is based on pay-per-use service, sometimes referred as “On-demand software” or can be used by

subscription fee also (Temporary usage license). In this model, the application software is installed and operated in the cloud only by the service providers and users can access the services from the cloud providers. This process simplifies the maintenance and support to a great extent, as the users don't need to install and execute the application on own computes. The cost of SaaS system is a monthly or yearly flat fee per user. This service is very useful for business as this helps them reduce the set-up cost as in this business mostly outsource the hardware and software maintenance and support to the cloud provider.

- **Cloud Clients** is defined as usage of Cloud computation by users via client devices such as laptops, computers and smartphones. Web browsers are also used for interaction with the cloud software applications.

3. Deployment Models Of Cloud Computing

Deployment models consist of different types of clouds Private cloud, Public Cloud and Hybrid cloud. These are the major clouds, which are used for computing [5].

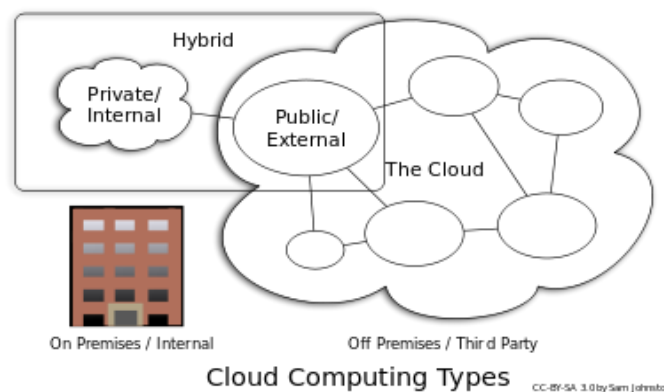


Figure 3: Deployment models

Private Cloud: It is a cloud infrastructure utilized for single organization, which can be controlled by third party or internally, which can be arranged externally or internally. This type of clouding provides scalability, automation, provisioning, and flexibility and monitoring. The main purpose of private cloud is not to offer services for external customers but for usage of one organization and maintaining its own data centers. Private cloud is not very useful for small-medium sized businesses but its typical usage and suitable for large businesses. Its main concern is related to the security of the cloud and is protected by a firewall.

Public Cloud: The main purpose of this cloud is to provide data for public usage. Service providers use Internet to make resources such as software applications and storage for the general public. Some of the examples of this public cloud is IBM's Blue cloud, Amazon Elastic Compute Cloud, Sun Cloud and Google AppEngine. This cloud is very economical as there is no setting up cost for the users. The setup, hardware, applications and bandwidth costs are born by the provider only. The cost of the services is very nominal as the service provides "Pay per Usage" and the cost is incurred on the capacity of data consumed by the user.

Public cloud cannot be used for every organization, as there are some limitations. The main issue lies with the security and configuration, making it very open for hacking problems. Therefore using this cloud for sensitive data can be very unsafe.

Hybrid Cloud: This cloud is used by the companies to maintain both private and public clouds simultaneously. The hybrid approach is used to manage the private cloud internally while using public cloud when needed.

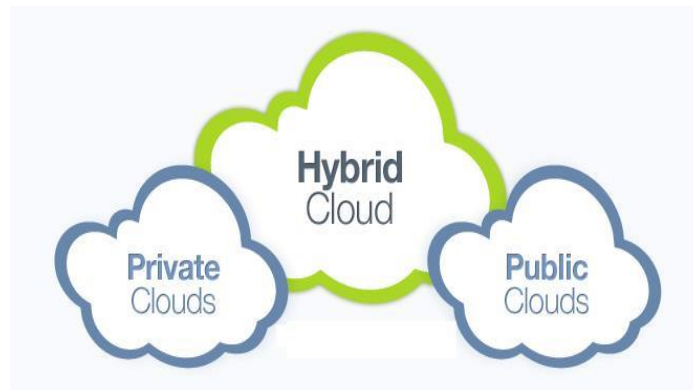


Figure 4: Hybrid Cloud.

This approach is used to balance the load or can be used during peak season. The extra amount of data is sent to public cloud for computing. This will also be beneficial during predictable outages: hurricane warnings, scheduled maintenance windows, rolling brown/blackouts.

4. Security

Security is one of the biggest concerns in Cloud Computing. Cloud Computing provides users the flexibility to use stored data and process in various third party data centers. It has different service models and deployment models. Issues related to security in cloud computing are divided into two different matters. First one is security issue faced by the cloud or service providers whereas second matter is issue faced by the customer or user of those services. It is very important for both the service provider and user to maintain the security of the data. As company should protect their client data and applications by ensuring their infrastructure is protected and up to date. The responsibility does not only lies in the hands of company, clients should also secure of their data and applications by keeping strong passwords and authentication measures. One of the security concerns in Cloud Computing is data isolation. Cloud service providers often store more than one customer's data on the same server in order to cut down the cost of the services and to maintain its efficiency due to which there is a possibility that that one user's private data can be viewed by other users (possibly even competitors). When data from different organizations are stored on public cloud, it loses its ability to have physical access to the servers hosting its information due to which online stored data (business sensitive and confidential data) is at high risk from the insider. According to a recent survey and report from Cloud Security Alliance, the third biggest attack in Cloud Computing is from insiders. It is very important for the service providers to keep a background check for employees who are in charge of the main servers in the data center and data centers should also be monitored for any unsafe and suspicious activity [6].

5. Conclusion

As we have discussed about cloud computing, how data computation is done in different models. The best way of storing data without consuming much physical space is adopting the process of cloud computing. In recent year, a high trend in cloud computing has been noticed because of its high demand as user have started opting for cloud computing technology. This gives the user flexibility to work without spending much on the set-up cost. The data stored online is easily available at any point of time, provided internet connection is available even from third party data centers.

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