Review paper on Cloud Computing

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Abstract
"Cloud computing" is recent buzzword in IT world. The future of computing in technical as well social perspective is shown by the phrase. Cloud computing based on the concept of centralizing computation and storage in distributed data centers maintained by third party. This application is much more than simple internet. The main purpose of cloud computing is to provide IT as a service on demand with feature of greater flexibility, scalability, availability, reliability to the cloud users at low cost. Through this user can access the resources they actually reside at the location other than user's own computer or other Internet connection devices. This new concept has benefits like to be used in the field of e-governance or in rural development of country like India. Finally we discuss some of the issues that this area should be dealt. Cloud computing relies on sharing of resources to achieve coherence and economics of scale cloud computing also focuses on maximizing the effectiveness of the shared resources. Cloud computer resources are usually not only shared by multiple users but are also dynamically reallocated per demand.
Keywords: Cloud computing, models, services of cloud computing, review of papers on cloud computing.

1. INTRODUCTION
The basic concept of cloud computing can be understood by the following definition according to NIST [1].
"Cloud computing provides shared pool of resources (computers resources like networks, server, storage) on the demand of the user in ubiquitous and simple way that can be provisioned to the user with a very little management effort.

From the above definition we can conclude that the cloud computing provides hardware and software resources available on the internet on the demand of the user. cloud computing provides user a shared pool of resources on demand of the user, to which the user subscribe and use for the time he wants to use and this all is achieved with the help of virtualization, which further helps in reducing the cost of implementing or adding more hardware parts to achieve the requirements of the user

In cloud computing there is no need to know the physical location, configuration of the system which provides the service. Basic characteristics of clouds are: Massive scale, homogeneity, virtualization, low cost software, advance security, services orientation and geographic distribution. The user can use the application without installation and by accessing internet user can manage their personal files at any location through cloud computing. Cloud computing provides more effective computing using the concept of centralizing storage, processing, bandwidth and memory. [2]
The Availability of cloud computing is required Software, hardware, application, platform, infrastructure and storage with an internet connection.

2. FEATURE OF CLOUD COMPUTING
According to the definition of the cloud computing there are mainly five essential characteristics of the clouds. It is understandable that missing any of those characteristics that a service can't be considered as cloud computing [3].
On demand capabilities: In business, cloud computing provider will secure the cloud computing services, it considered as a software vendor. The user can access services and can change services through online control panel without interaction with the server or it can be done directly with the provider. [3]
Broad network access: Now a day, all digital devices like tablet, mobiles, laptops, etc can access broad networks wherever they get connected with a simple network access point. In business, this feature is very useful because employees can stay connected with contracts, proposals, projects and customers during office hour's even off-times. [3]
Resources Pooling: In the cloud computing environment, the employee can share the data or services at the same time from any location at any time within business management software hosted at the cloud. [3]
Rapid elasticity: Cloud computing also offers the flexibility and scalability up to that extent that you can add or remove the users and services as per your need. [3]
Measured service: The cloud computing is so affordable that you can access services and for what type of service you used you have to pay for it. It can be monitored from both sides including provider's side and user's sides and hence improves transparency. [3]

Figure1 Cloud Computing Environment

Figure2 Cloud Computing Service Model

3. CLOUD COMPUTING ISSUES

Technical issues: Through this technology we can access the data and information at anywhere and anytime. So it is clear that cloud computing needs high technology and strong internet connection. As we know technology is always prone to some temporary suspension of operation or other technical issues. Therefore it requires high maintenance and good internet connection for using server at all the time.

Security in the cloud: The major issue in the cloud computing, it is security issue. Before using this technology, the all company's important information shared with a third party cloud service provider. Due to this company comes under a great risk. Therefore we have to choose the most reliable service provide so, that our information will remain secure.

Prone to attack: The information stored in cloud is available for external hackers and threats. As we know data cannot be completely secure on the internet. There is always some chance of hacking of sensitive data.

4. SERVICE MODEL OF CLOUD

Cloud provides elastic, scalable and shared resources to user which helps to provide services to the client. Now a days, Cloud computing is an advance technology, which provides different services like software as a service, monitoring as a service, network as a service, platform as a service, database as a service, hardware as a service, infrastructure as a service and human as a service. Now we will briefly discuss about three main service models that are:-
1. Infrastructure as a Service(IaaS)
2. Platform as a Service(PaaS)
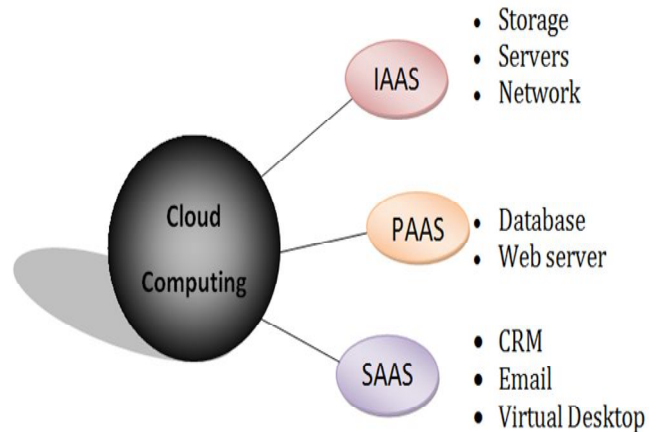3. Software as a Service(SaaS)

4.1 Infrastructure as a service (IaaS)

The services providers of Iaas offer computers- physical or virtual and other resources in cloud. As a name implies it provider's infrastructure as a service. Client is the permitted to install applications software and operating system but users do not have any knowledge of basic architecture. The service like the virtual resource (VR), physical resources load balancers and local area network provides by the provider. This service mainly used by organizations/business organization to maintain their system. To avoid spending extra money on new hardware installation in business organization it is better to use cloud. Cloud can achieve this target through virtualization technique without adding new hardware in the existing to fulfill the user requirement. As we know cloud pay according to the service it provides due to this an organization will save great amount of money. [7]

Advantages:
- Reduce expenditure on hardware and human resources.
- Reduce the risk of ROI (return on investment.
- Low barriers to entry.
- Usually platform independent.
- Infrastructure costs are shared and thus reduced.[5]
- Cost saving
- Scalability and flexibility[6]
- Focus on business growth [6]

Disadvantages:
- The efficiency and productivity of business depends on the vendor's capabilities.
- Potentially greater long term cost.
- Centralization requires new/different security measures.[5]

4.2 Platform as a service (PaaS)

As the name implies this type of cloud computing providers' development environment as a service where user can write application and develop softwares.

Further development of Saas is resulting in Paas application delivery model. All the facilities or requirements that are need to complete life cycle of developing and delivering the web applications are provided by the Paas all those services are available on internet without need of downloading or installation of software for developers or end users.

Advantages:
- Consumes cloud infrastructure.
- Underlying infrastructure security
- Streamlined version deployment[5]

Disadvantages:
- Centralization requires new/different security measures.
- Multi-tenancy
- Data security

4.3 Software as a service (SaaS)

In software as services, the facilities to access the application software and data base are provided to the user. The application run on the platform and infrastructure is managed by the cloud. In Saas the users have to pay only for what he uses according to his requirement therefore Saas is also referred as "On-demand software". In this model, application software is installed and operated by cloud providers on the cloud and cloud users can access it from cloud clients. Cloud infrastructure and platform where application run are not managed by cloud users. Therefore there is no need to install and run the application on user's own computer. SaaS is designed for multiple users also known as application service provider model. Examples are online video games, Microsoft window live.

Advantages:
- UI powered by thin-client applications.
- Communication on vis APIs
- Stateless
- Loosing Coupled
- Avoid capital expenditure on software and development resources.
- Streamed line and iterative updates.[5]

Disadvantages:
- Application Security
- Multi-tenancy
- Data security

5. Cloud Deployment Model

Cloud computing deployment model has been divided into four categories.

5.1 Public cloud

The most popular model of cloud computing to all users is public cloud model. In this model could services are provided through virtualized environment developed using polled shared physical resources and share on public network such as internet. Same infrastructures shared by multiple clients. Through this model, operations can be performed efficiently and effectively.

Public cloud service based on-demand pay-per as use and may be free. In this provider manage the hardware, application and bandwidth costs due to this fact this model is quiet easy and inexpensive. Customer uses the resources according to his requirement this avoids the wastage of resources. It is used in large industry group. Example: Amazon Elastic Compute Cloud, IBM's Blue Cloud, Sun Cloud, Google App Engine.

Advantages:
- **Freedom of self service**: - A user can create his own cloud instead of depending upon the third party.
- **Metered charges**: -In other words we can say that user only have to pay for the amount consumed by him.
- **Availability**: -Another important aspect of the cloud is that it can be accessed by the user anywhere in the globe so there will be no delay in the work.

5.2 Private Cloud

This cloud is specially developed for a single organization. In private cloud dates is shared by the organization in a way so that the interference of the outsiders can be avoided. This fact makes the private cloud more secure but less flexible as compare to public cloud.eg. Amazon Virtual Private Cloud, Microsoft Private Cloud.

Private clouds main characteristic are as given below: [4]
- **Increased Security**: -Organization data is very crucial so it need to be secured from any threat from the outsiders. Private cloud comes with the embed security tools and do provide security against unauthorized access and hacking.
- **Dedicated Resources**: -Private cloud does not make any compromise. An employee of the organization will have his own resources (like processor time) which in further will increase the performance of the system.
- **Customization**: Organizations can customize the clouds according to their requirements so that it can suit the environment. So they have the control.

5.3 Hybrid Cloud

Hybrid cloud is collection of multiple clouds like private community of public. All those clouds have their own unique identities, but they all are determinate as a unit. Hybrid cloud offers standardized access to data and application.[8]
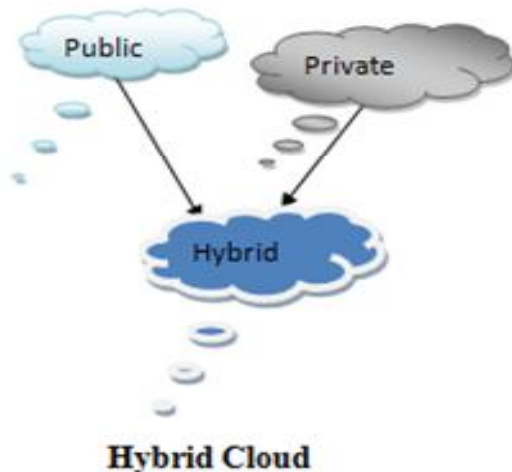
Figure3 Hybrid Cloud

While working with private clouds sometimes we need some more storage space so we use some of public clouds this is known as cloud bursting. In this case organization will only have to pay for the extra space being consumed. [4]

Some Characteristics of Hybrid Cloud:
- Optimal utilization
- Risk transfer
- Availability

5.4 Community Cloud

When different organizations have a common interest then instead of using different clouds they will share the infrastructure among each other.[4] One or several organization can be used the community cloud but they all share common characteristics such as their mission, security, polices, regularly compliance need. This task can be given to a third party or can be handled internally. Now cost is spread among the different organizations who are sharing the infrastructure so cost is spread among users. [8]

6.Conclusion

In this paper we discuss about various deployment model and cloud services of cloud computing. Cloud computing is recent buzzword in IT world. The Leader in the companies, such as Microsoft, Amazon, IBM, and Google provided their initiative in promoting cloud computing. But still there are some issues in the cloud computing like testing issues, security issues, and privacy issues. Software testing is an analysis conducted to provide stakeholders with information about the quality of the product or service under test. Static testing uses for checking the correctness of a program by analyzing its syntax structure, procedure, etc. As a software testing method, static testing finds out faults from source code by analyzing the static characteristic of the program, such as parameters, mismatching, improper nested-loop branches, recursion not allowed, variable never used, null pointer reference, suspicious computation, etc. Static testing more efficient than the dynamic and find out software defects very quickly.

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