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A Review On Issues And Challenges Of Cloud Computing

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ABSTRACT
Cloud computing is the services offered to the users over the web on rental basis. cloud computing is being referred to the accessing and configuring and accessing the online applications. There are some technologies being used for the general understanding of the cloud computing they are: utility computing, virtualization, SOA, grid computing. It provides an advanced virtual space for organizations to deploy their applications or run their operations, In this paper the issues and the challenges that is being faced by the cloud service providers are being discussed.

Keywords
cloud computing, IAAS, PAAS, SAAS, virtualization, security, privacy, reliability.

INTRODUCTION

The Cloud computing is a new general purpose technology which is based on through which information will be stored in the servers and provides the services on-demand to clients. It is a type of computing that relies on sharing of the computing resources. defines "Cloud computing is a pay-per-use model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. the networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction".[5,6]
Cloud is been referred to a internet or network .it provides the services over the networks. Some of the applications like e-mail, conferencing, customer relationship management (CRM) runs on the cloud environment, it refers to the configuring and accessing the online applications.[2]

Fig.1 cloud computing

Characteristics of cloud computing

1. On demand self service - computer services like the e-mails, applications, or server service can be provided without requiring human interaction with each service provider.

2. Broad network access - Cloud Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms.

3. Resource pooling - The provider's in the computing resources where pooled together to serve multiple consumers using multiple-tenant model, with

different different physical and virtual resources which are dynamically assigned and reassigned according to consumers demand. The resources comprise among others storage, processing, memory, virtual machines and the email services. pooling altogether of the resource builds economies of measure.

4. Rapid elasticity – the Cloud services can be expeditiously and flexsible provisioned, in some cases automatically, to immediately scale out and rapidly released to immediately scale in. To the client, the capabilities existing for formularization often appear to be unbounded and can be purchased in any amount at any time.

5. Measured service – the Cloud computing resource usage can be controlled, measure and reported by providing transparency for both the provider and the consumer of the utilized service. Cloud computing services can use a metering capability which enables to control and optimize the resource. This may implies that just like electricity or municipality water IT services are charged as pay per use. The more you utilize the higher will be the bill.

6. Multi Tenacity - it is the 6th characteristics of cloud computing advocated by the Cloud Security intimacy. It relates to the need for policy-driven origination, detachment, segmentations, governance, service levels, and chargeback/billing models for different client constituencies.

Service models

1. IAAS – the term Iaas means infrastructure as a service this model give infrastructure ingredients or components to clients. Iaas generally provides the resources which are managed and easily scaled up. Components in the Iaas includes virtual machines, storage, networks ,firewalls, load balancers and other fundamental computing resources where the client can deploy and run arbitrary soft ware's which includes the operating systems and applications. The clients of Iaas can direct access to the lowest level software in the stack. One of the largest IAAS providers is the Amazon web services.

2.PAAS – the term Paas means platform as a service. The Paas model delivers a pre built application platform for the client. The Paas can automatically provisions and scales required infrastructure components depending on the applications requirements. The paas factors are execution database, web server, deployment tools execution runtime etc. it provides the capability to deploy the cloud infrastructure consumer created or acquired application created by using the libraries, programming languages and the tools supported by the providers.

3.SAAS- the term Saas means software as a service the Saas provides the capability of the clients to use the applications running on the cloud infrastructure. The Saas providers has complete control of application software. online mail, and project management system, are the examples of Saas applications.[5]

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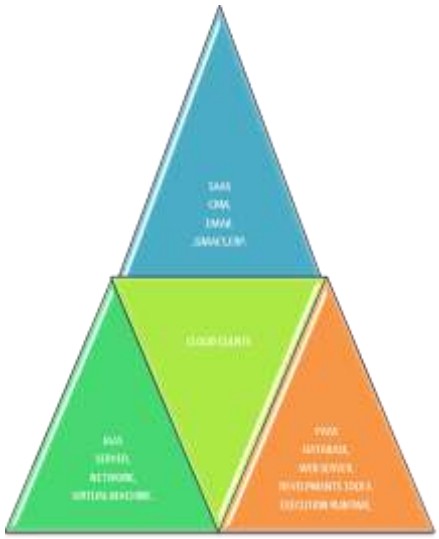

Fig.2 service model of cloud

Some novel cloud services are:

DAAS - Daas means database as a service , it is a cousin of Saas. the Daas confer a user friendly interface for accessing and organizing data. This types of services are very useable for many business, and Internet-based applications.

NaaS – Naas means Network as a Service With NaaS, providers offer clients a virtualized network .NaaS represent services for network transport connectivity. NaaS implicates the optimization of resource determination by considering network and computing resources as a organized whole.

IPMaaS – IPMaas means Identity and Policy Management as a Service With this service, providers deliver identity and policy management to customers.

C. Deployment tools of cloud

1. Private cloud – It can be maintained and operated by the single organizations with multiple consumers the organizations use the software that enables cloud functionality like VMware, VClouds Director etc.It may exist on or off premises.

2.Public cloud – this is provisioned for open use by the public a business. Academic or government organization or some combination of them may operate and manage it.Some of the popular public cloud may include Amazon web services, Google App Engine and Microsoft Azure. It exists on the premises of the cloud provoder.

3.Community cloud –this cloud is owned and managed by one or more person or by a third party. Its infrastructure is shared between the specific community (eg. Mission, compliance, security).

4.Hybrid cloud – hybrid cloud is the mixture of the computing resources provided by the community , public and private cloud. Hybrid cloud can be useful for providing secure services like employee payroll processing and customer payment.[9]

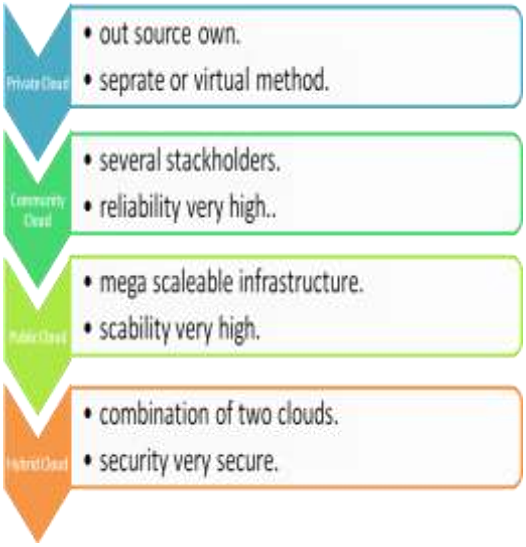

Fig.3 Deployment model of cloud computing

Advantages of Cloud Computing

1. **Accommodation -** You can influence your information anywhere you can also meet to the Internet.
2. **Security -** Most companies use industrial level security software which make it harder for hackers to get at your information.
3. **Backups -** You have a backup of your material in case your local computer crashes.
4. **Collaboration -** With your permission, others can approach, view, and modify your documents.
5. **Environmentally friendly -** It takes fewer resources to cloud , thus excepting energy. Some dealing take it a step further and incorporate cloud computing into their telecommuting strategies.
6. **Easy Approach to data -** Once you register yourself in the cloud, you can accessible the data's and information's.
7. **Fast Deployment -** it gives you the advantage of fast deployment. Once you operate for this method of functioning, your hole channel can be fully dynamic in a minutes. the amount of time taken here will depend on the exact kind of technology that you need for your business.
8. Availability- we can Access the information anytime and where ever we want. The Internet cloud infrastructure maximizes enterprise productivity and efficiency by ensuring your application is always acquirable. This permits for simple complicity and communion among users in multiple locations.
9. Flexibility for development - The cloud is easily scalable so companies can add or subtract resources based on their needs. As companies develop, their system will develop with them.
10. Efficient improvement - Cloud computing delivers faster and more accurate retrievals of demand and data. With certain time, it is the most achieved improvement plan.

Disadvantages of Cloud Computing

1. **Security breaches-** remote server security makes it difficult, but not tendious, for hackers to access your data. If there is understanding among the servers where your data is collected, your private data may be disclose to the world. There is also a good opportunity that more than just your data may be affected—we are talking possibly millions of other users.
2. **Storage limits -** There is also a boundation being on a THE magnitude of the data and information that can be stored.
3. **Slow speeds - I**t is slow.the process of Uploading and downloading of big documents or articles may take a long period of time.
4. **Limited features -** If you use remote software that's provided by the storage service to manipulate and convert your data, it usually decreases the features of a program running locally.
5. Security and privacy – the security and privacy in the cloud computing is not so good. The data and application might not be very safe on the public cloud.
6. No longer in control - When the services being moved to the cloud, you manage your information's and the data.
7. May not get all the features - All the cloud services are same. Some cloud providers tend to offer limited versions and enable the most prevalant features , so you may not accept every feature you want. Before

signing up, make sure you may know that what your cloud service provider is offering.

8. No Redundancy-A cloud server is not dispancable nor it is coveredup. As technology and techniques may fail here and there, debard getting burned by purchasing a redundancy scheme. Though it is an extra cost, in most cases it will be well worth it.

9. Bandwidth issues- For idealistic adherance, clients have to design accordingly and not pack big amounts of servers and storage devices into a small set of data centers.

10. Storing information in the cloud could make your company penetrable to outer hack attacks and remedies. As you are consious, nothing on the Internet is absolute, safe and hence, there is always the lurking feasibility of fraud of the sensitive data.

ISSUES AND CHALLENGES

Although cloud computing has been widely adopted by the industry, but the cloud computing research is quite at the early stage. Several irreducible issues are not been fully addressed, while new challenges keep emerging from industry applications. Here we will now summarize some of the challenging research issues in cloud computing.[1,4,7,8]

In the cloud security is an evolutionary sub division of domain of computer security network and, more considerably, information security. It conclude to a huge set of, techniques, and controls deployed to secure data, applications, and the associative infrastructure of cloud computing

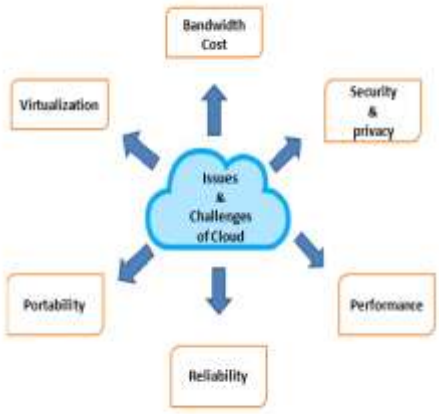

Fig.4. Issues and challenges of cloud

Security and privacy

. It is clear that the security issues play the important role in hindering Cloud computing acceptance. there are many security threats which comes from inside or outside of cloud providers/consumers atmosphere which has classified into the outsider threats, and the insider unfavorable attacks, data loss, issues concerned to multi-tenancy, loss of control, service break-down. In a cloud environment the security features has to take possession to defend cloud illusory infrastructure. Performance and Availability , outside attacks, inimical Insiders, Loss of Control, Service Disintegration and Multi-tenancy are the attacks that has to be mainly addressed. The adventitious venture is possessed by various persons and institutions e.g. the hackers that do not have direct access to the cloud. The in lying security risk is a well-known issue which can be posed by organizational affiliates,current or former employees,

contractors, other parties that have received power to an organization's servers, and data to facilitate operations. Cloud computing poses confidentiality anxieties because the service providers influence the data that is on the cloud that could deliberately be changed or even recapture posing serious business trust and legal consequences. Providers ensure that all critical data are encrypted and that only authorized users have access to data in its entirety. Credentials and digital identities must be protected as should any data that the provider conjoin or yield about customer activity in the cloud.

Security issues like the phishing, botnet , data loss pose serious threats to organization's data and software, the mutual computing and the multi-tenancy model resources in cloud computing has deputize new security challenges that require novel techniques to deal with. For ex, hackers can use Cloud to manage botnet as Cloud frequently provides more authentic infrastructure services at a relatively cheaper price for them to start an attack. Cloud clients' data stores in data centers that cloud providers diffuse all over the globe within hundreds of servers that communicate through the Internet have several well-known potential risks within them. Because cloud services are using the Internet as their communication infrastructure, cloud computing involves several kinds of security risks.

Resource availability /reliability

Reliability denotes how often resources are available without dislocate and how often they fail. Reliability remains a challenge for cloud service providers everywhere Cloud providers still lack round-the-clock service. It is important to monitor the service being provided using internal or third-function device. It is imperative to have plans to handle manipulation, performance , and business dependency of these services. the important phase that form solid problems for the reliability of cloud computing is down time. One way to obtain reliability is dispensable resource utilization

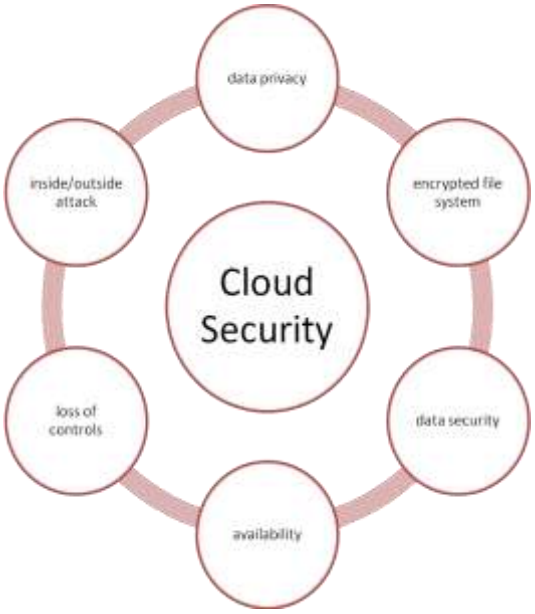

Fig.5 cloud security features.

Availability can be understood as the possibility of obtaining the resources whenever they are needed with the consideration to the time it takes for these resources to be supplied. regardless of assigning planning having property for high reliability and accessibility, the services in the cloud computing can experience denial of favor rush, stuff outages and natural accident.

Interoperability and portability

Interoperability is the ability to use the same tools or application there on various cloud

service providers programs. A possible solution to the resources availability problem is the use of multiple clouds to ensure the required amount of resources.

Portability and interoperability both are relate to the facility to build systems from re-usable components. Portability and interoperability of infrastructure components are achieved by hardware and virtualization architectures. The major types of cloud computing portability to are application portability, platform portability and data portability. These are the portability in that order of application platform and data factors.

Cloud users must have the flexibility of migrating in and out and switching to clouds whenever they want without no vendor lock-in time. The reason for the current bad portability and limited interoperability between clouds is the lack of standardized API's.

Performance

performance is the second biggest issue in cloud environment. The cloud provide enhanced performance when a user moves to cloud computing infrastructure. Performance is commonly on purpose by capabilities of applications working on the cloud system. Imperfect performance and non-availability of information to an end user means the same as the services required are not in working order. Highlighted some factors in control of bad performance in cloud computing atmosphere. These include: limited bandwidth, disk space, memory CPU cycles, web connection and most forcefully delay which reduces the end-to-end reaction time. Many times users prefer to use services from more than one cloud where some applications are located on private clouds while some other facts or implementation being on public or network cloud.

Virtualization

Virtualization is a technique, which allows to share single physical instance of an application or resource among multiple organizations or tenants (customers). It does so by assigning a logical name to a physical resource and providing a pointer to that physical resource when demand. In computing, virtualization means to create a virtual version of a device or source, like the storage devices, server network or even an operating system where the framework splits the resource into one or more performance environments. Operating system virtualization is the use of software to allow a piece of hardware to run multiple operating system images at the same time. virtualization software was adopted faster than anyone imagined, including the experts. In the field of IT there where three areas where the virtualization is making, network virtualization, storage virtualization, head roads and server virtualization. It can be part of an overall trend in enterprise IT that includes autonomic enumerating, a scenario in which the IT conditions will be able to manage itself based on perceived occupation, and benefit computing, in which computer processing power is seen as a utility that clients can pay for only as needed. Virtualization makes infrastructure management more compound, and huge automation is required in organization to

support the key aspects such as automation, on-demand and flexibility necessity.

CONCLUSION

Cloud computing is a paradigm, where several challenges and issues are there like the privacy ,security, virtualization, bandwidth cost, resource availability, performance, portability etc.

In this paper the concept & models of the cloud computing is discussed and the issues, threats and emergency challenges that are needed to be addressed carefully are also focused. In Future work re-encryption techniques are needed to be discussed.

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