GENERIC CLOUD SERVICES FRAMEWORK MODEL

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ABSTRACT:

The concept of conventional data storage and application deployment at distributed locations has its own benefits and drawbacks. The benefit is that the load sharing is implemented effectively. And in the event of any eventuality the complete data is not damaged or lost. The disadvantage is that the centralised control over the data and applications cannot be maintained. To implement conventional centralised system dedicated complex network add communication systems are needed resulting poor performance. With the increase in Internet infrastructure the dependency on dedicated network may be reduced or eliminated. To overcome this problem the emerging technology known as cloud computing is becoming popular and cost effective. It provides flexibility and implementation of centralised systems using Internet. The increasing trend of using Internet and dependency over Internet in the near future. There are different cloud services available. In this paper I will discuss about different search services and implementation mechanism of cloud based services and issues related to it.

Keywords: Cloud Computing, Internet, Iaas, Paas, Saas, Cloud Architecture

1. **Introduction:**
   The conventional data storage and management systems are used to store large scale operational and non-operational data. The maintenance and security of these data centres is a crucial point. Such systems are efficient enough when the operation of an

organization is either situated at a single location or distributed. The situation become different when the data is centralised, for instance when offices are scattered at different locations and data is maintained at one central location such as banks etc. In such systems the operation and management of the data becomes quite challenging and difficult.

The optimal solution to this problem is cloud computing. It is mechanism to make available, on demand, computing services and resources using the Internet, there are different models in practice to implement a cloud computing system. The broad idea of cloud computing is the aggregation of servers, computers, storage systems, programs and data. The basic cloud-based systems consist of database storage devices, application servers, database servers etc. known as IT infrastructure, placed at some appropriate location anywhere in the world. The access / services of this infrastructure is provided to users, organisations etc. using Internet, located anywhere in the world. The basic architecture of a cloud based system is shown in fig.1
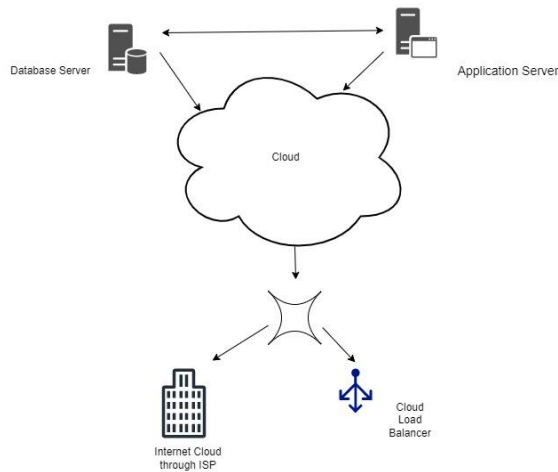

Fig. 1 Basic Architecture of a cloud based system

There are different types of cloud computing services namely *Public Cloud, Private Cloud, Hybrid Cloud and Community Cloud*.

Public Cloud -In public cloud the data and services are accessible to different users and organizations.

Private Cloud -the private cloud is accessible to users within an organisation or among a group of closed users. It is not accessible to all.

Hybrid Cloud -this kind of cloud is the combination of public and private cloud. Hybrid cloud is more flexible than public and private cloud put independently. It gives more combined power of both public cloud and private cloud.
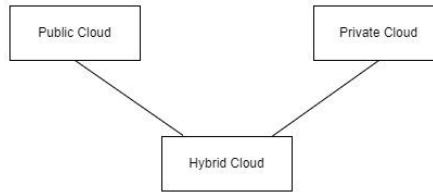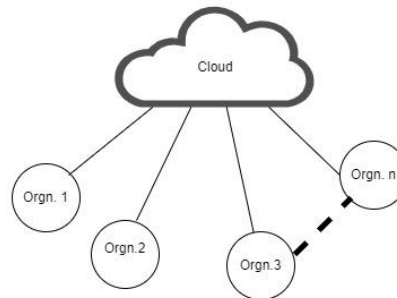
Fig. 2 Hybrid Cloud

Community cloud-

Fig. 3   Community Cloud

Community cloud - is the type of cloud accessible to certain closed groups such as organisations etc. Several organizations or any closed group may be the part of the same community cloud. The broad layout of community cloud is shown in Fig. 3.

The cloud computing model is chosen depending upon the application and working model of the organization or an individual. There are several benefits of migrating operations on cloud platform. The overheads of the maintenance, security, safety, management, operations etc. are generally managed either by third party or the department meant for this purpose. Hence the actual users are mainly focused with their domain only.

There are different approaches in cloud technology. The cloud framework consists of different services as shown in fig4.
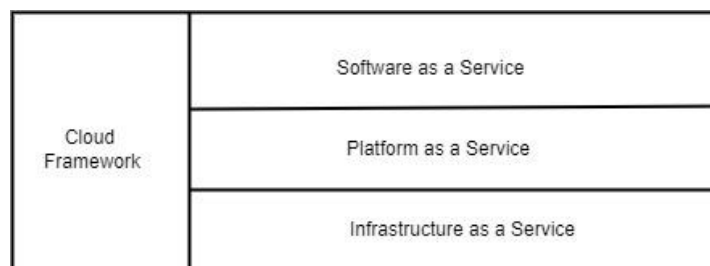

Fig. 4   Cloud Framework

The model of a cloud computing framework is selected depending upon the service requirement. The common cloud services comprises,
SaaS - Software as a Service
PaaS - Platform as a Service

IaaS- Infrastructure as a Service

SaaS - consist of software as a service. The user need not acquire the complete software system instead they use the software using Internet. The software is deployed at the service provider's server and may be used by the client/user. The user is not to pay the cost of entire software cost instead liable to pay only for the service he is availing.

PaaS - platform as a service some services require hardware and applications for hosting. Instead of deploying their own server, users can avail services using Internet. There are many service providers who are providing platform as a service, a few of these companies are Salesforce.com, Amazon E2C and Microsoft Azure.

IaaS - infrastructure as a service, there are so many data centres, which are providing infrastructure as a service. Many such organisations have deployed their own data centres and sell their services. The users are able to avail data storage, keep operational data in their IT infrastructure and pay as they use it. The users are allowed to avail server resources etc. there are certain companies in this field such as HP adaptive, rock space, Amazon E2C and S3. the user may choose the vendor. Each vendor has different services end tools to offer.

2. **Design Mechanism of Cloud Based Systems**

In my work, I have proposed cloud based infrastructure. The implementation model is proposed in Fig. 5. In my proposed model I have emphasised on storage and application infrastructure and web service framework.
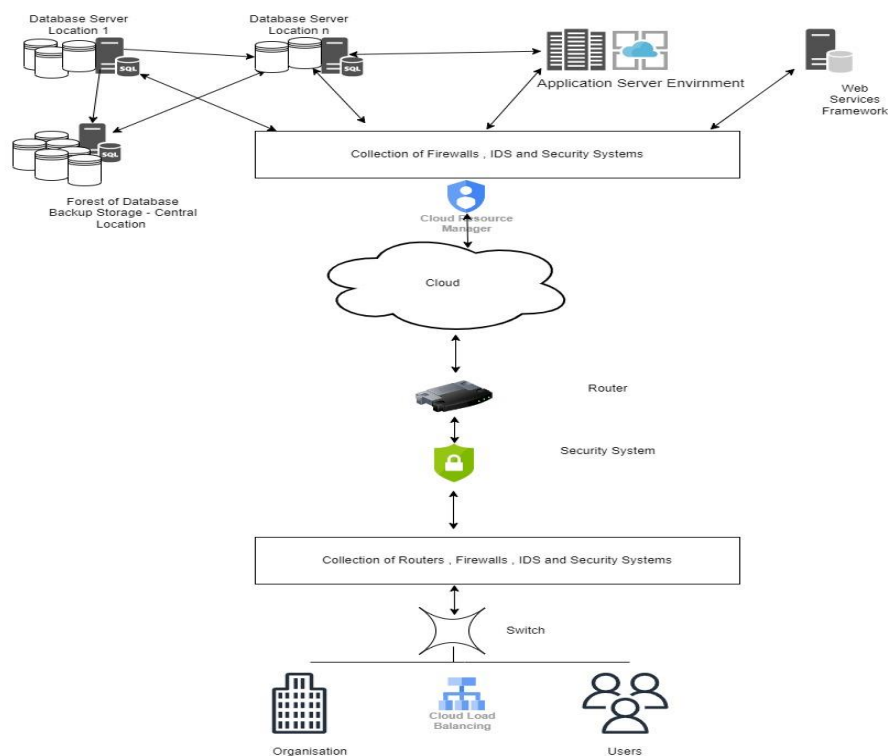

Fig. 5 Cloud Implementation Model

In the proposed architecture there is a collection of infrastructure components. Some components are storage devices, data servers, application servers etc. the purpose of each server is to provide specialized services as required by its users[3][4].

There are collections of database servers located at different locations and connected with each other. Also there is a forest of database backup storage to keep the back up of these database servers the purpose of these servers is to provide data storage and database related services to its clients. Similarly there are application servers and web servers. The task of the application server is to deploy the application for clients and provide them the required services, similarly the web servers are used to deploy web services such as web hosting etc. These servers are connected with the clients through internet. For security reasons, the connectivity between these servers and outside world has been done through and via collection of security mechanisms such as firewalls, IDSs and other security systems. The services of all these servers are managed by a cloud resource manager. Further the services are connected with the customer through routers and other networking devices. For enhanced security, same set of security mechanism is implemented at client entry point and the accessibility is provided to the customers / clients.

These servers will store user data, deploy the application or host the web services and the user is liable to pay only the services the client is availing. The maintenance and management part is the responsibility of the cloud service provider. There are certain cloud service providers such as Amazon Web Services (AWS) , Who are providing different cloud services to its clients on paid basis.

3. **Security and privacy issues**

The privacy issues are an area of concern in cloud services. The data is stored at the location of service providers. This data is away from the actual users. In such situations there is always a risk of data manipulation, data theft etc. there are various examples in the past which suggests that the security of the data has been compromised. The data, information and programs are on the cloud, there are increased vulnerability towards threats and cyber attacks.

There are certain other factors, which are considered while analysing the standing of ant cloud service. Some of them are Privacy, integrity, security, confidentiality, availability, strategy, data policies, backup management, risk management and resolution, Cloud integration [6].

Cyber Attacks : the backend off the cloud service is Internet infrastructure. All the cloud services require Internet connectivity to function. The Internet usage is not completely protected and different types of users have access to the Internet. The clouds are always at threat of cyber attacks such as denial of service, IP spoofing, virus attacks, MAC spoofing etc. the denial of service occurs when some malicious users pumps meaningless data packets or dummy data packets in huge quantity continuously into the network to make the congestion in the network system. In this way the network becomes very slow add unable to perform its own functions, resulting bona-fide users are denied of services they want to use. IP spoofing is used to enter into the system using false IP address or IP address of someone else with the intention to hide its own actual identity. Similarly, Mac spoofing is used to hide the actual identity off the hardware they are using.

4. **Conclusion and Future Work** :

The increasing popularity of Internet applications And easy accessibility of services anywhere in the world will make cloud computing more popular and powerful. Being Internet based service, there are certain securities and integrity issues which need to be considered add addressed while implementing cloud based services. Moderate to high speed Internet connectivity is required to make effective use of cloud based services; areas having poor internet connectivity are not suitable for cloud based services. It is expected that the competition Among different service providers shall increase in terms of Cloud based services and cost in the years to come

In future I have planned to work on security issues and to suggest secure and robust solution on security of cloud based systems.

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