CHALLENGES, SERVICE MODELS AND DEPLOYMENT MODELS OF CLOUD COMPUTING

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Abstract

Cloud computing is the development of parallel computing, distributed computing, grid computing and virtualization technologies which define the shape of a new era. Cloud computing is an emerging model of business computing. In this paper, we explore the concept of cloud architecture and compares cloud computing with grid computing. We also address the characteristics and applications of several popular cloud computing platforms. In this paper, we aim to pinpoint the challenges and applications of cloud computing. We identified several challenges from the cloud computing adoption perspective. It aims to build and predict complicated service environment with powerful computing capabilities through an array of relatively low-cost computing unit, and using the complex deployment models like SaaS (Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service), to distribute the powerful computing capacity to end-users. However, security and privacy issues present a strong obstacle for users to adjust into cloud computing systems. In this paper, we examine several cloud computing system providers about their concerns on security and privacy issues.

Keywords— Cloud computing, Grid computing, Architecture, Challenges, Cloud Platforms, security.

I. INTRODUCTION

Cloud computing is a complete new technology. It is the development of parallel computing, distributed computing, grid computing, and is the combination and evolution of Virtualization, Utility computing, Software-as-aService(SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). Cloud is a metaphor to describe web as a space where computing has been pre installed and exist as a service; data, operating systems, applications, storage and processing power exist on the web ready to be shared. To users, cloud computing is a Payper-Use-On-Demand mode that can conveniently access shared IT resources through the Internet. Where the IT resources contain network, server, storage, application, service and so on and they can be deployed with a lot fast and easy manner and least management and also interactions with service providers. Cloud computing can much pick up the ease of use of IT property and owns many advantages over other computing techniques. Users can use the IT transportation with Pay-per-Use-OnDemand mode.

II. CLOUD COMPUTING CHALLENGES

- ➢ Security & Privacy
- ➢ Interoperability & Portability
- ➢ Reliable and flexible
- ➢ Cost
- ➢ Downtime

➢ Lack of resources
➢ Management of Multi-Cloud Environment

i .Security and Privacy of Cloud

The data store in the cloud must secure and provide full confidentiality. The customers rely on the cloud supplier so much. This means that the cloud supplier should take essential security actions to secure the data of the customers. Securities are also the responsibility of the customer as they should offer a strong password, should not share the password with anybody, and frequently change the password when we did. If the data is exterior the firewall there may be some issues which can remove by the cloud supplier. Hacking and malware are also one of the main problems as it can affect several customers. Hacking can lead to data loss; disrupt the encrypted file system and a lot of other problems. ***ii. Interoperability and Portability***

The customer must be provided with the services of movement in and out of the cloud. There should be no connection period as it can create a obstacle for the customers. The cloud should have the capability to provide services on the location. One of the Cloud challenges is remote access which can remove by the cloud supplier so that the customer can access the cloud from anyplace security.

iii. Reliable and Flexible

Reliability and flexibility are also one of the challenges of cloud customers and it can remove in a way that the data provided to the cloud should not disclose and the host should offer the reliability to the customers. To remove this challenge the services provided by the third party should be monitored and control should be done on presentation, robustness and production dependency.

iv. Cost

Cloud computing is inexpensive but modifying the cloud to the customer's order can be sometimes costly. Moreover, it can cause obstacle to the smallscale institute is modifying the cloud as per their order can sometimes cost more. In addition, transferring of data from the Cloud to the location can also sometimes be costly.
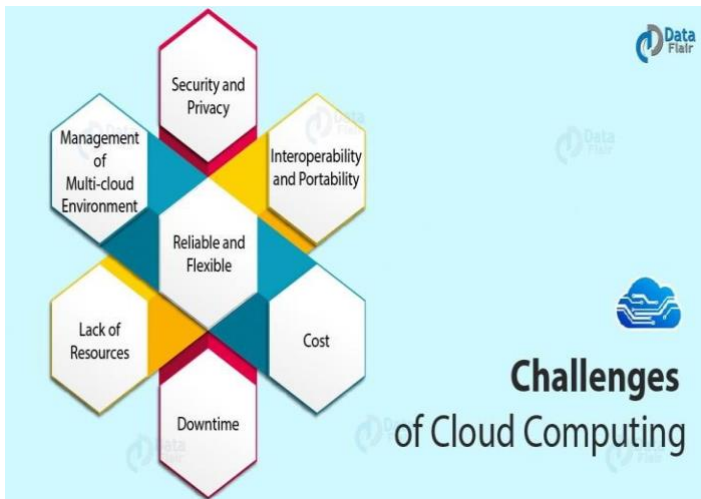
v. Downtime

Downtime is the ordinary challenges of cloud computing as no cloud supplier guarantees a platform that is free from downtime. Internet connection also plays an main role as if a company has an unreliable internet connection then there may be a problem as they can face downtime.

vi. Lack of resources

Lack of resources and knowledge is also one of the major challenges faced by the cloud business and many companies are eager to overcome this challenge by hiring more employees which are more qualified. These workers will not only help to remove the challenges of the companies but also they will train accessible staff to benefit the company. Today many IT workers are working to enhance the cloud computing expertise and CEO of the company is judgment it difficult as the people are not much skilled. It believes that workers with knowledge of the latest growth and the technologies related to it will become more valuable in production.

vii. Management of Multi-Cloud Environment

Companies these days do not use a single cloud instead they are using various clouds. On an standard company are using 4.8 different public and private clouds due to which their organization is hindered. When a company uses multi-cloud there are so many complexities faced by the IT team. This Cloud challenge can remove by guidance workers, utilization of proper tools, and doing research.
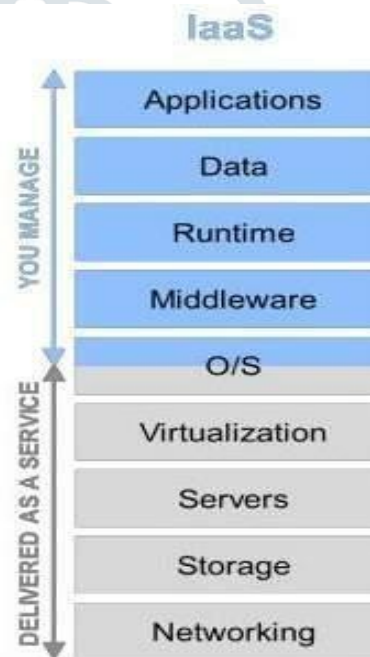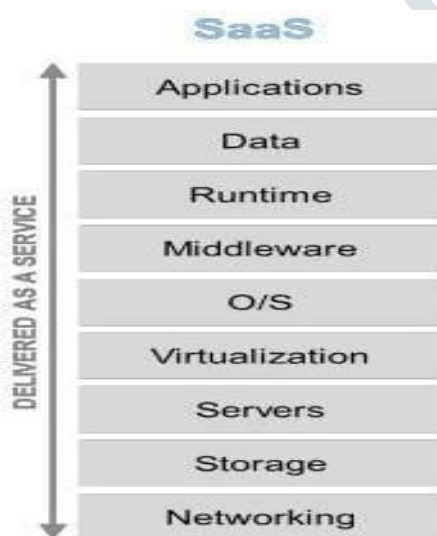
Challenges of Cloud Computing

III.CLOUD SERVICE MODELS

A. SaaS

SaaS or Software as a Service is a model that gives rapid access to cloud-based web applications. The seller controls the entire computing load, which you can contact using a web browser. These applications run on the cloud and you can use them by a paid licensed payment or for free with imperfect access. This eliminates the need for installing applications on each of your computers with the protection and carry taken over by the seller. Some known example of SaaS includes **IBM, Google apples, Sales force, Zoho** etc..

B.IaaS

IaaS or Infrastructure as a Service is essentially a virtual provision of computing capital over the cloud. An IaaS cloud supplier can give you the entire range of computing infrastructures such as storage, servers, networking hardware next to maintenance and support.

Businesses can choose for computing capital of their obligation without the need to fit hardware on their grounds. **Amazon Web Services, Microsoft Azure, and Google Compute Engine** are a few of the top IaaS cloud service providers

C.PaaS

Platform as a Service or PaaS is basically a cloud base where you can expand, test and sort out the different applications for your production. Implementing PaaS simplifies the process of activity software development. The virtual runtime environment provided by PaaS gives a constructive space for increasing and testing applications.

The entire assets offered in the form of servers, storage and networking are convenient either by the corporation or a platform source. **Google App Engine and AWS Elastic Beanstalk** are two distinctive examples of PaaS. PaaS is also contribution based that gives you elastic pricing options depending on your production requirements.
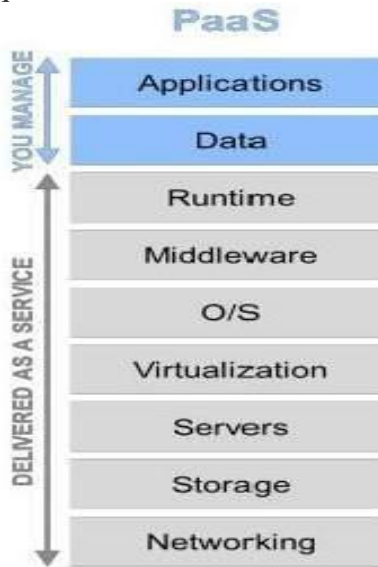

IV. DEPLOYMENT MODELS

- ❖ Public Cloud (or External Cloud)
- ❖ Private Cloud (or Internal Cloud)
- ❖ Hybrid Cloud (or Mixed Cloud)
- ❖ Community Cloud(or Group Cloud) *A.***Public**

Cloud (or External Cloud)

In this model, computing assets are dynamically provisioned over the Internet using Web applications or Web services from trusted third party supplier. Public clouds are run by third parties, and applications from special customers are likely to be varied together on the cloud's servers, storage systems, and networks. Although the public cloud has convincing advantages, there existing the hidden risk of safety, regulatory policy observance and quality of service (QoS) necessities.
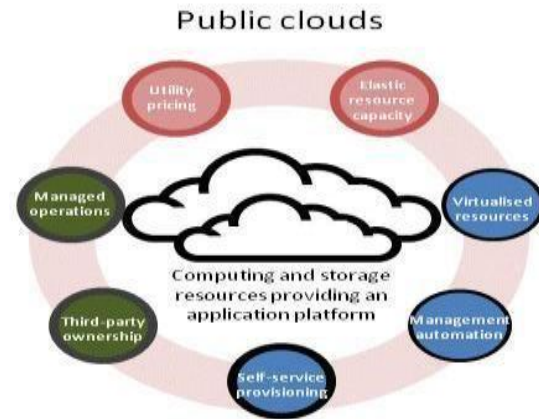
*B.***Private Cloud (or Internal Cloud)**

In the private cloud consumption, computing resources are used and controlled by a private activity. It is generally deployed in the enterprises data hub and managed by internal personnel or service provider. The major advantage of this model is that the safety, compliance, and QoS are below the control of the enterprises
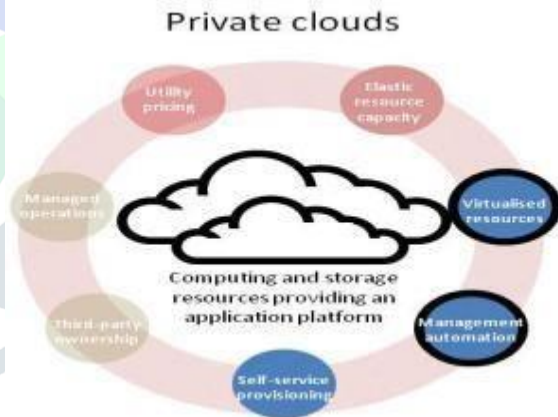

*C.***Hybrid Cloud (or Mixed Cloud)**

The Hybrid Cloud environment intersects and combines several public and private cloud models. It enables the enterprise applications to running state-steady workload in the private cloud, and requesting the public cloud for serious computing resources when peak workload occurs.

Hybrid clouds introduce the difficulty of determining how to handout applications across both a public and private cloud
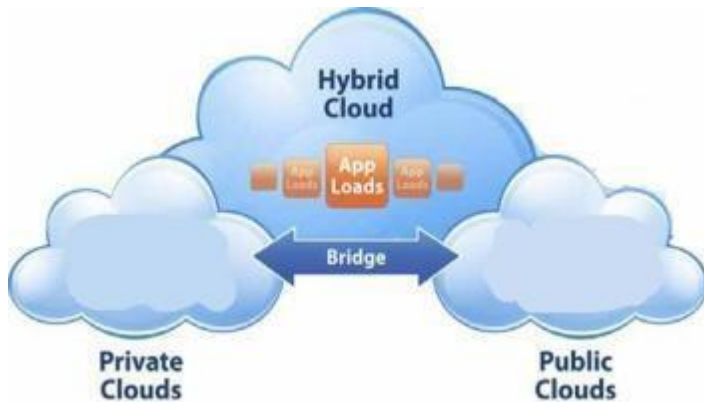
D. Community Cloud(or Group Cloud)

In this Community consumption model several organizations together construct and share cloud infrastructure as well as policies, necessities, values, and concerns. The cloud community forms into a degree of financial scalability and selfgoverning equilibrium. The cloud infrastructure could be hosted by a third-party retailer or within one of the organization in the community. This is rising cloud used by many social networking website like facebook, orkut, etc.
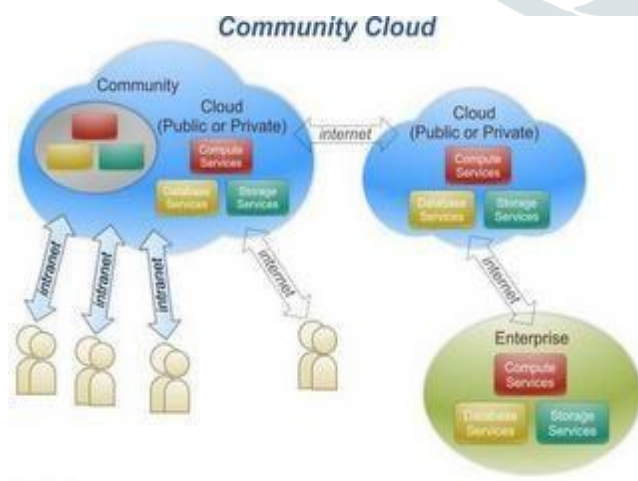
V. CONCLUSION

Cloud computing is an emerging computing environment that is popularly increasing. Many organizations like Microsoft, IBM, Amazon and Google have provided that the cloud services to clients. Customers are using different deployment models to safe their institute still there are many issues related to the cloud security. Many IT organization technicians working with the safety challenge. Several groups in institute have recently been formed, such as the Cloud Security or the Open Cloud association, with the goal of exploring the potential offered by cloud computing and to create a common language among all different providers. New technologies and capabilities may result in a additional development of the cloud computing model. Companies currently considering such a move must consider the advantages against the probable drawbacks, and decide if they are ready to launch their data into the cloud.

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