Cloud Computing Applications : A Review

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ABSTRACT

In recent years, cloud computing is an emergent field in the Internet era. There is rapid development in high-performance computing and technology extended from grid computing to cloud computing to provide computing resources on pay per basis. Cloud service providers developed applications for users to easily access cloud services with quality of service (QoS) because cloud application plays an important role in service delivery of cloud organization. This paper provides a review of cloud computing technology, cloud models, deployment and cloud applications such as types of applications, reliability, and security. Finally, open research issues are provided for future research development

Keywords: Cloud computing, Applications, Security, storage.

I. INTRODUCTION

Cloud computing has come with the concept of computing resources as a utility, which can be consumed based on pay on demand the same as you go fashion like electricity, water and gas . Cloud services mainly controlled and supported by data centers . Cloud computing as a utility is a long-held dream in the information technology sector and it will become true with the advent of low-cost data centers . Security is another major obstacle for opening up the vision of computing as a utility . Data centers are the most important entity in cloud service architecture. Data centers act as cloud providers, which provide different types of cloud services to users . A range of information technology companies provides services to their users as pay as you go fashion . These companies are Facebook, Amazon, Salesforce, Yahoo, Cisco, Microsoft, and Google .

They have their own data centers deployed at different geographical locations

▪ **Cloud computing service models**

Cloud computing is also said to be a model for acquiring flexible on-demand access to network with an interconnected pool of configurable IT resources like networks, server machines, storage devices, applications, and online services. These cloud models promote the availability and composed of five essential characteristics, three service delivery models, and four deployment models.

The cloud delivery model is further divided into three models.

1. **SaaS (Software as a service)**

This is one of the types of cloud delivery model in which the software or services are used on the cloud provider base and consist of software applications [19].

The connectivity is made through interfaces such as web or email. SaaS offers services promptly requested by the user's such webmail, interface application or software and business applications such as ERP, CRM, and SCM [20]. SaaS platform provides a limited approach at the client end that makes the server end much resourceful. Therefore it provides minimal integrated control for service-based functionality to endusers of the client.

2. PaaS (platform as a service)

This is the way to provide a base (platform) to the consumer for the deployment of cloud infrastructure with the help of its applications without enabling own local machine. PaaS refers to sharing platform layer and software layered resources such as operating systems and application-based frameworks. All the categories of cloud computing provide support as per the standards or limitations of resources. Client users adopt PaaS service mainly because of less than optimal solutions or results of IaaS. This statement looks rationale at some point, but in reality, it depends on the specifications of the IT applications involved in the network

### 3. IaaS (infrastructure as a service)

In IaaS cloud service provider shares a pay-as-you-go facility to access the several features of network servers, computational applications, and storage over the web or internet [24]. IaaS can be a single virtual or physical service or a combination of both [25]. It behaves as the basic unit of IT resources, which minimizes the workload and reduces the number of computing resources.IaaS, PaaS, and SaaS are proposed to be layer-based services one after the other .

IaaS provides a platform of physical control to users of cloud services such as computer devices, networks, and storage used in the virtualization process. PaaS is the second step in accessing the cloud resources by taking control of the system at management level such as operating system and run time application .

SaaS is the last service based on the end-user application, where the main control remains with the vendor or owner of the cloud . This is the simplest description of three services at the primary level understanding each offer a dynamic layer of reflection after that. IaaS abstracts absent the physical compute, organize, capacity, and the innovation required to virtualizes those assets. IBM has provided chart based information for understanding the nature of services controlled at different layers is also shrink or extend the resources. It will certainly adjust the expenditure cost and unnecessary availed infrastructure

● Cloud Deployment Models

The deployment models are dependent on the infrastructure of the network. There are four common cloud deployment models:
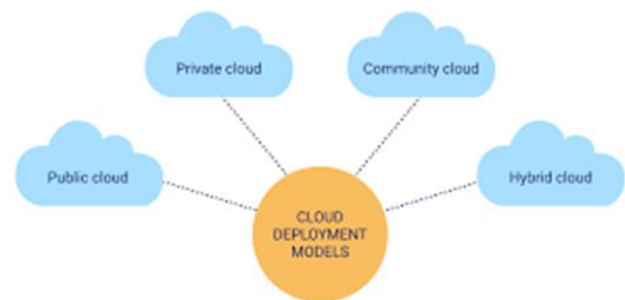
A. Public cloud
B. Private cloud
C. Community cloud
D. Hybrid cloud

1. Public Cloud

The public cloud makes it possible for anybody to access systems and services. The public cloud may be less secure as it is open for everyone. The public cloud is one in which cloud infrastructure services are provided over the internet to the general people or major industry groups. The infrastructure in this cloud model is owned by the entity that delivers the cloud services, not by the consumer.

2. Private Cloud

The private cloud deployment model is the exact opposite of the public cloud deployment model. It's a one-on-one environment for a single user (customer). There is no need to share your hardware with anyone else. The distinction between private and public cloud is in how you handle all of the hardware. It is also called the "internal cloud" & it refers to the ability to access systems and services within a given border or organization.

3. Hybrid cloud

By bridging the public and private worlds with a layer of proprietary software, hybrid cloud computing gives the best of both worlds. With a hybrid solution, you may host the app in a safe environment while taking advantage of the public cloud's cost savings. Organizations can move data and applications between different clouds using a combination of two or more cloud deployment methods, depending on their needs.

4. Community cloud

It allows systems and services to be accessible by a group of organizations. It is a distributed system that is created by integrating the services of different clouds to   address the specific needs of   a community, industry, or business. The infrastructure of the community could be   shared between the organization which has shared concerns or tasks. It is generally managed by a third party or by the combination of one or more organizations in the community.

II.   LITERATURE SURVEY

This paper presents a systematic literature review to explore the current key issues related to cloud computing adoption. This is achieved by reviewing 51 articles published about cloud computing adoption. Using the grounded theory approach, articles are classified into eight main categories: internal, external, evaluation, proof of concept, adoption decision, implementation and integration, IT governance, and confirmation. Then, the eight categories are divided into two abstract categories: cloud computing adoption factors and processes, where the former affects the latter. The results of this review indicate that enterprises face serious issues before they decide to adopt cloud computing. Based on the findings, the paper provides a future information systems (IS) research agenda to explore the previously under-investigated areas regarding cloud computing adoption factors and processes. This paper calls for further theoretical, methodological, and empirical contributions to the research area of cloud computing adoption by enterprises.

III. CONCLUSION AND REVIEW

It conclude that cloud computing resources have still become one of the common tools to extend the business along with lowering the operational cost. The most important factor of cloud computing applications will remain the data/information security, availability, accessibility, integrity, and redundancy. With the advent of social network and app-based features, huge data of users has become the top priority. The organizations tend to not compromise with the security issues and sometimes become susceptible to threats as well as malware attacks by hackers. This can be one of the reasons for the existence of a professional who is hired by the companies to cope with hacking vulnerabilities. And eventually, cloud applications are more prone to such disastrous intrusion because of their web-based applications or virtualized resources. In either way, the research or understanding of the most updated scripts, applications, programming languages and security tools can help in solving the most complex security threats of the cloud environment.

IV. FUTURE SCOPE

Cloud Computing simplifies accessibility, provides virtual storage space, and addresses backup issues. It also provides security against unauthorized access and loss of data. It helps organisations to save huge investments on services and infrastructure for data storage, software licenses, servers and hardware.

The scope of cloud computing is very bright. According to a report, the cloud computing market in India is at $2 billion and is expected to grow with an annual growth rate of 30%. By 2020, the cloud computing market in India is supposed to reach $4 billion and create more than a million jobs in this country.

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