CLOUD COMPUTING: AN OVERVIEW

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Abstract—Cloud computing is the novel technique of networked computing. By using cloud computing, there is no need to purchase any software and hardware, instead we can hire the hardware and software as an abstract service from a cloud service provides. These days, cloud computing has become a popular approach of low cost as well as reliable and ubiquitous computing alternative for the entire computing fraternity ranging from small user applications to high end scientific, engineering, and commercial applications. An overview of cloud computing is presented in this paper. The overview includes an introduction to cloud computing and different deployment and service models in cloud computing. Various advantages and disadvantages of cloud computing are also cited in the presented overview.

Index Terms—Cloud Computing, Cloud deployment models, Cloud service models, SaaS, PaaS, IaaS

I. INTRODUCTION

Collection of vast, heterogeneous and dynamic resources which present a united face to the computing service demanding world is called cloud. NIST has formally described cloud computing as, **"Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models [8].**

Cloud is present at remote location and it provides services to the demanding users over the network. Cloud computing refers to manipulating, accessing and configuring the application online by using online data storage and infrastructure [3]. Now-a-days almost all organizations (mid-scale and large-scale) are exploiting the cloud because of its high end benefits in terms of economic gains and service quality and reliability gains. Economic gains are there because users are able to use the required computing infrastructure from cloud through high speed networks on the basis of "pay-as-you-go" [8]. Service quality and reliability gains are there because cloud has the ubiquitous availability, resource replication which provides strong backup support, vast collection of resources which provides high end computing capabilities. The organizations or users who are using cloud pay for the services such network, resources, computing services etc.

In many working areas, cloud computing is still in the early stages. Most of the mid scale and large scale organization adopt cloud computing for cost saving and for some more features like best and latest technology, scalability. So many private and government agencies survey on this for a few years, large and mid scale of organizations are concentrating on cloud computing and sharing of

services at same level with the help of which service provider provides to access the programs, resources, storage on the distributed system.

The main use of cloud computing is to share software, application and sharing information over the network through the use of remote server network [6]. By the most of researcher's survey, now a day's most of the persons won't do their work with software working on their personal computers. They try to use internet based applications like Google doc and other applications run on smart phones because it provide mobility. In our smart phone there is no need to install full software package. We just install internet based application of that software (which is the module of whole software) and perform our task and also pay according to used service.

This paper is organized as follows. Section 2 describe different deployment model of cloud computing. Section 3 explains different service models of cloud computing. Advantages and disadvantages of cloud computing are included in Section 4. The last section presents some concluding remarks.

II. DEPLOYMENT MODELS OF CLOUD COMPUTING

Deployment model of cloud computing is depends upon the type of access to the cloud. Means what kind of services is provided by cloud to any service receiver and how the receiver uses that service. Mainly the cloud has four deployment models.

(a) Public cloud

Public cloud provides accessibility to general public. We can say that cloud and its services are open to all the public. It is less secure because of its openness, which open up more hacking opportunities for hackers. In public cloud the vendors are not doing enough to maintain security, because of its public nature. Vendors cannot estimate the numbers of users of service. The hackers believe about security of public network that's why we have problems regarding less security and data stolen in public cloud, for example E-mail [3].

(b) Private Cloud

Private cloud provides services to be accessible within an organization on its private network. Only members of that organization can use its service. It increases the security to data because of its private nature [2]. The organization which use the private cloud, can store their data and resource on cloud. Before transmission of data in the network firstly they encrypt it and the receiver or members have to decrypt the data before use. The encryption and decryption is done by the use of a special key, which is known to only members of the organization who are the part of private cloud [8].

(c) Hybrid Cloud

Hybrid cloud is the mixture of public and private cloud, means it provides some of its services restricted within the organization and some of its services are open to all in the public [1] [8]. The best example of hybrid cloud is the user of smart phone applications. These applications are free to all the users but with some limited service, and if any user pays for full version of that application, that user can have full access to all services of that application. We can say that how much we pay that much we can use service.

(d) Community Cloud

Community cloud allows services to be accessible by group of several organizations. It may be managed by an organization or a third party [2]. In the community cloud the service provider unit is one organization from the group which is going to use service. The organization which is service provider keeps track of services used by other organizations and manages the service [8].

III. CLOUD SERVICE MODELS

Service model of cloud computing provides users with different services at different level of abstraction. Cloud provides us three layer architecture of abstraction. Infrastructure is the lowest layer which deals with basic storage and hardware which we use to build cloud computing like switches, routers and connectivity of these. The middle layer is Platform, which provides higher level of abstraction and services to develop, maintain application in same environment. The Application/Software layer is the topmost layer, which directly deals with user and provides complete applications as a service.

(a) Software as a service (SaaS) means user simply use internet to access software which are developed by someone else and offer as a service over the internet. With the help of Saas, users do

not have access to the infrastructure being used to host the software [1][8]. We can say that Saas provides purchased on demand. Example of SaaS is applications which we use on phone and computers.

(b) Platform as a service (PaaS) offers platform for both completed and in-progress applications [2]. We can say that Paas provides platform where applications are developed using set of instructions and tools that are supported [1][8]. It also provides high level of abstraction, which allows developers to developing applications and not to worry to know how much memory will be using [2].

(c) Infrastructure as a service (IaaS) provides the infrastructure where computing resources like processing power, memory and storage from IaaS provider and user can use these to deploy and run their applications. IaaS provides low level abstraction, which allows users to use this infrastructure with the help of virtual machines, and users pay only for resources they use [8].

IV. ADVANTAGES AND DISADVANTAGES OF CLOUD COMPUTING

Advantages

- The major advantage of cloud computing is it reduced the setup costs.
- Cloud computing provides scalable environment means we can expand it and customized its software stack, which reduces the investment risk and meets the users need at different situations.
- In infrastructure as a service backup recovery is very easy. There is efficient incident response when data need to be recovered.
- If we talk in terms of power management, cloud computing serves as a virtual server which is easy to implement as compare to physical server.
- The small scale business can also adopt cloud computing because of its scalability.
- We can easily localize and rectify the hardware failure in cloud computing with the help of service provider.
- The data is spread throughout the network and thus make easy for business to use preferred sites.
- We can easily process the data in time which reduce the work load.
- Cloud computing is built based on large-scale resources; the use of large-scale resources on cloud can reduce the rental and fee and thus can attract more users.
- Cloud can be billed according to the actual needs of users. Cloud computing eliminate the risk of one time large investment, and it allows users to use only the necessary resources depending on their need. This kind of feature is known as On-Demand service.

Disadvantages

- The major disadvantage of cloud computing is less security because it is under supervision of third party [4].
- The second major disadvantage of cloud computing is the dependence on network connectivity. The network failure results in loss to the company by delay in execution.
- In cloud computing data is distributed throughout the cloud network. The data is. Not specifically segregated, this is the reason of problems when specific need to be segregated.
- The quality of service tells the efficiency of a cloud network. A reliable service provider provides desired quality of service may be difficult to source and the process consume too much time to implement [5].

V. CONCLUSIONS

Cloud computing is the way to provide service to number of users through network. Service providers need to share their resources and capabilities. This paper give an overview of cloud computing deployment and service models and its advantages and disadvantages by using this we can improve our existing systems.

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