

A Survey on Cloud Computing Architecture Characteristics Deployment Models and Challenges

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Abstract – Cloud computing is the process of storing and accessing of information and applications with the help of internet or web instead of your own hard disk. Cloud computing is a distributed resource pooling where anyone can access a particular resource from anywhere i.e. a single resource can be used by multiple people at different locations. This resource are like software, hardware, infrastructure, platform, networks, servers, storage spaces etc. it provides the services to the users based on their requirement and these services are easy and low cost to use. This paper is for everyone who are willing to take a study on cloud computing here we are going to see the architecture , characteristics , deployment & service models of cloud computing.

Keywords– cloud computing, hypervisor, public cloud, private cloud, hybrid cloud.

I. INTRODUCTION

Cloud is a software (or) service in internet. It is nothing but internet. It provides many services to the users through the internet. Cloud computing is mainly focus on the storing & accessing the information from anywhere in the world i.e. the information once stored in cloud that can be view from any location with the help of web. Here the stored data will not be at any physical devices all the data will be stored in internet, so any modifications on particular information done at one place can be viewed (or) known by other people at different location & have the access over the data at different places.[1]

The cloud computing provides its services based on the requirements of the users as the IT field is changing faster the transaction & transfer of data need to be very fast. It cannot be done with the traditional way but the faster transfer of data and control over data at any place is achieved with cloud. When the data is stored in a particular physical machine it can be accessed by that machine only but in cloud it is changed we can get the data from anywhere at any time to any location.

II. ARCHITECTURE OF CLOUD COMPUTING

Cloud computing architecture refers to what are the components required for the cloud. These components include the front end back end computation process storage areas etc.

The cloud computing is a combination of the many cloud components these components are loosely coupled that means they can be broken easily [2]

The cloud computing architecture is mainly consists of two types they are

- Front end
- Back end

The following Fig.1. Architecture of Cloud Computing refers the architecture of cloud computing.

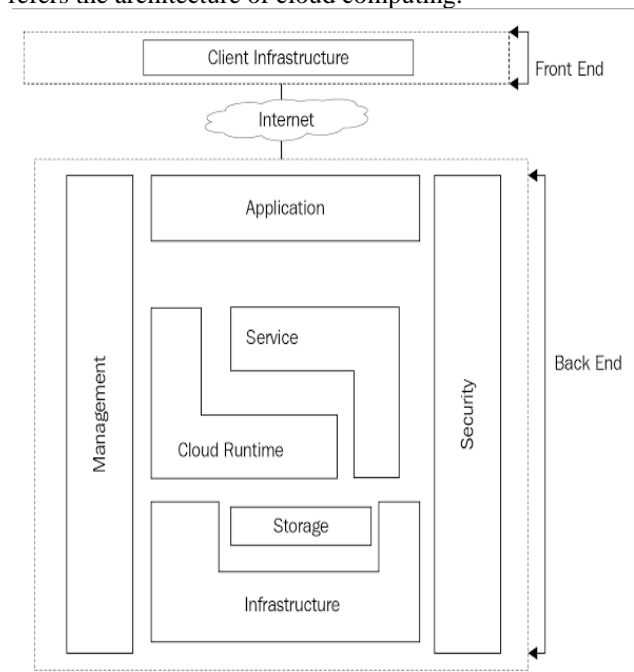


Fig.1. Architecture of Cloud Computing.

1. Front End

The web pages and the client side view are called as the front end. The front end is the area where the client is going to interact with the cloud and place the request and get the response from the cloud. The front end design should be very attractive and easily understood by the client that should not create any confusions to client.

2. Back end

The main architecture of cloud computing is the back end. This is the place where the actual work is going to take place i.e. the data is going to store here it has huge data storage, service models, deployment models, the data is going to process here, the request from client comes to back end and the process is done here, virtual machines, security and privacy & cloud infrastructure.

The cloud infrastructure has the following 6 components

1. **Hypervisor:** Hypervisors are virtual machine monitor (VMM) that empowers various virtual working frameworks to at the same time run on a PC framework. These virtual machines are additionally alluded as visitor machines and they all offer the equipment of the physical machine like memory, processor, stockpiling and other related assets. This improves and upgrades the usage of the basic assets. The hypervisor disengages the working frameworks from the essential host machine. The activity of a hypervisor is to oblige the necessities of a visitor working framework and to oversee it productively. Each virtual machine is autonomous and don't meddle with each another in spite of the fact that they run on a similar host machine. They are no chance associated with each other. Indeed, even now and again one of the virtual machines crashes or faces any issues, different machines keep on performing regularly.
2. **Management software:** it is used to control and maintain.
3. **Deployment software:** it is used to deploy the applications in cloud.
4. **Network:** it is the key to access the cloud. Network allows the users to use network as utility
5. **Server:** it monitors the clients. It is responsible for the allocation and deal location of the resources based on the request made by the clients. Servers are not to store the data here.
6. **Storage:** the cloud stores a particular information at different locations as the data at one location is damaged we can recover the data from another locations

3. Service Models:

Cloud services are the services available to the client over the internet. These services are provided by the cloud providers. The main aim of these services is to provide the easy and scalable access to any application or resource [3]. There are three types of services models they are

1. IaaS(Infrastructure As A Service):

This service provides all the infrastructure that are need like storage, processing, networks, servers, virtual machines, routers, hardware, and other computational process. The IAAS deals with the virtualization of the resources from one physical machine and shared to multiple systems in a virtual manner over internet. Some other resources provided by the IAAS are

- Virtual machine disk storage
- Virtual local area network
- Load balancer
- IP address

2. Pass (Platform as A Service):

It provides runtime environment for the applications. It gives the development tools. Simply it provides the operating system as a service to the client with this even the layman can easily understand and work with it. We can get the entire required platform for development and testing of anything.

1. Some of the benefits are as follows
2. Lower administration overhead
3. Low cost of owner ship
4. Scalable solutions

3. SaaS (Software as A Service):

It provides the software as a service to the clients. Software is installed at a single physical machine and shared over the internet across the multiple networks or the multiple systems.

4. Characteristics of SAAS are

1. Access of software in the internet
2. The software updates & upgrade automatically
3. Theses software are maintained by the cloud

5. Some benefits of SAAS are

1. Performance
2. Scalability
3. Efficiency
4. Modest s/w tools
5. Efficient use of license
6. Multi tent solutions

III. CHARACTERISTICS OF CLOUD COMPUTING

Each and every cloud have the following characteristics

1. Resource s pooling

To provide a cloud services to multiple cloud consumers then cloud provider should need to pool computing resource with the help of multi-tenant model

2. On demand services

In cloud computing the allocation and re-allocation of resource and services are done based on the demand by

users. It is important feature of cloud. Here all the actions can be performed with out human interactions.

3. Large network access

Cloud is a very huge network that can be used to store (or) upload from any cloud and access , edit the information through any device with internet connection.

4. Availability

There is no limit for the resource we can get the requirements what we want and how much we want with low cost

5. Rapid elasticity and scalability

An extraordinary aspect regarding distributed computing is the capacity to rapidly arrangement assets in the cloud as assembling associations need them. And afterward to evacuate them when they needn't bother with them. Distributed computing assets can scale up or down quickly and, now and again, naturally, in light of business requests. It is a key component of distributed computing. The utilization, limit, and in this manner cost, can be scaled up or down with no extra agreement or punishments. Flexibility is a milestone of distributed computing and it suggests that assembling associations can quickly arrangement and de-arrangement any of the distributed computing assets. Fast provisioning and de-provisioning may apply to capacity or virtual machines or client applications.

6. Economical

Here we can take the services on rent based we need not to buy the resource so it is very economical

7. Security

Each and every cloud creates a copy of data in it and stores at different locations even if data lost in one location that can be recovered from another location

8. Pay as you go

In cloud the customer can pay money for the utilized space & cloud services only

9. Measured services

In cloud computing the cloud provider automatically monitor the cloud resource usage.

IV. DEPLOYMENTS MODELS

There are different types of cloud that are based on how the users are going to communicate with the cloud. Based on the access to the cloud from the users these are divided the data owner in the cloud data center will give the access to multiple people or he can restrict the access among people based on it the deployment models are of 4 types [4]

1. Public cloud

It is a type of cloud that can be accessed by common public i.e every one can access this cloud there are no restriction to anyone who every want a services from cloud they can approach the cloud and use the services of the cloud. The public cloud is open to all. The most popular public cloud is google drive. It can be also called

as open cloud. Open Cloud is a sort of cloud facilitating that permits the openness of frameworks and its administrations to its customers/clients no problem at all. A portion of the instances of those organizations which give open cloud offices are IBM, Google, Amazon, Microsoft, and so forth. This cloud administration is open for use. This sort of distributed computing is a genuine example of cloud facilitating where the specialist co-ops render administrations to different customers. From the specialized perspective, there is minimal contrast between private mists and open mists alongside the auxiliary structure. Just the security level depends dependent on the specialist organizations and the kind of cloud customers use. Open cloud is more qualified for business purposes for dealing with the heap. This sort of cloud is affordable because of the decline in capital overheads.

2. Private cloud

It is a type of cloud that is with in a particular organization or to a particular person. This private cloud can't be used or accessed by the other people or general public. The user should have the authorization to access the private cloud this are highly secured when compared with public cloud. Private Cloud likewise named as 'Inside Cloud'; which permits the availability of frameworks and administrations inside a particular limit or association. The cloud stage is actualized in a cloud-based secure condition that is monitored by cutting edge firewalls under the observation of the IT office that has a place with a specific association. Private mists license just approved clients, giving the associations more prominent authority over information and its security. Business associations that have dynamic, basic, made sure about, the board request based prerequisite ought to embrace Private Cloud.

3. Hybrid cloud

It is a combination of both public and private clouds here the general public can have the access to the cloud but not to the whole cloud some part of the cloud is restricted that area cannot be accessed by the common people that area is for only authorized people only. It can also called as the Half and half Cloud it is another distributed computing type, which is incorporated, i.e., it very well may be a blend of at least two cloud servers, i.e., private, open or network joined as one design, yet

Stay singular substances. Non-basic assignments, for example, improvement and test outstanding burdens should be possible utilizing open cloud while basic undertakings that are delicate, for example, association information taking care of are finished utilizing a private cloud. Advantages of both organization models, just as a network arrangement model, are conceivable in a half and half cloud facilitating. It can cross detachment and defeat limits by the supplier; subsequently, it can't be just

classified into any of the three organizations - open, private or network cloud.

4. Community cloud

It is the type of cloud that is within the hands of a group of people or group of organizations that belongs to same type or same community. Here the group of organization come to as community and buy the cloud they use the cloud for their benefits only the members of that community have the access over that cloud.

V. CHALLENGES IN CLOUD COMPUTING

Cloud computing is the concept that is listing from long back but it is shaping it full form in the recent days. The cloud computing is facing some challenges that has to overcome by the cloud computing the challenges are as follows

1. Security & privacy

The cloud has to provide the security to the data in it there are lot of user that uses the cloud each and every individual data has to maintain its own privacy and security.

2. Interoperability

The application designed in one platform and that application should has the ability to run on the different platforms it is the important and major challenge facing by cloud because the data or services should be available to users at different locations and different platforms.

3. Portability

The application has a portable nature from one cloud provider to another cloud provider.

4. Service quality

The cloud provider has to provide the service license agreement to the clients as the services of the cloud should be available to the users at 24*7 all the day. The services have to increases based on the request in order to achieve scalability.

5. Computing performance

The computation and the performance speed in the cloud should be high so that high speed band width should be provided.[5]

6. Reliability

He services and the resources are mostly provided by the 3rd party so the cloud has to verify or check the details of the 3rd party details like they are trusted or not only the reliable parties are only allowed and their services are only allowed to the clients.

VI. CONCLUSION

Cloud computing is the new trend that is using in each and every place. There are so many cloud providers like Google , Microsoft, apple , etc. all are doing the same thing by providing the services and resources based on the

request these help the small and medium scale organizations they have the economical advantage with it and facing the common and huge issues like SLA, security and privacy in the coming future these cloud providers are looking to overcome these issues as they need to improve the quality of their service and to place an image of their organizations in the minds of public.

REFERENCES

- [1]. Liang-Jie Zhang; Qun Zhou, "CCOA: Cloud Computing Open Architecture," in proceeding of IEEE International Conference on Web Services (ICWS), 2009, pp. 607-616, 6-10 July 2009.
- [2]. Shyam Patidar; Dheeraj Rane; Pritesh Jain "A Survey Paper on Cloud Computing" in proceeding of Second International Conference on Advanced Computing & Communication Technologies, 2012.
- [3]. Yashpalsinh Jadeja; Kirit Modi, "Cloud Computing - Concepts, Architecture and Challenges" in Proceeding of International Conference on Computing, Electronics and Electrical Technologies [ICCEET], 2012.
- [4]. Qi Zhang, Lu Cheng and Raouf Boutaba, "Cloud computing: state-of-the-art and research challenges".
- [5]. Tharam Dillon, Chen Wu and Elizabeth Chang, "Cloud Computing: Issues and Challenges," in Proceeding of 2010 24th IEEE International Conference on Advanced Information Networking and Applications, pp. 27-33, 20-23 April 2010.
- [6]. Anitha Y , "Security Issues in cloud computing", "International Journal of Thesis Projects and Dissertations (IJTPD) Vol. 1, Issue 1, PP: (1-6), Month: October 2013
- [7]. Jinesh varia," AWS Cloud Security Best Practices", "White Paper", November 2013
- [8]. Alexa Huth and James Cebula,"Basics of cloud computing", "United States of emergency leading teams", 2012
- [9]. Parsi Kalpana , "Data security in cloud computing using RSA" , International Journal of Research in Computer and Communication technology, ISSN 2278-5841, Volume 1, Issue 4, September 2012.
- [10]. Vmware, "Securing the cloud, A review of cloud computing, security implications and best practices"
- [11]. Miklau and D. Suci, "Controlling access to published data using cryptography," in Proceedings of the 29th international conference, 2011, page no-31- 46
- [12]. Luit Infotech Private Limited,"What is cloud computing" .
- [13]. H. Narayanan and M. Gunes, "Ensuring access control in cloud provisioned Healthcare systems," in Consumer Communications and Networking Conference (CCNC), 2011, page no-.247-255.
- [14]. Chittaranjan Hota, Sunil Sanka, Muttukrishnan Rajarajan, Srijith K. Nair, "Capability-based

Cryptographic Data Access Control in Cloud Computing”, “Int. Journal of Advanced Networking and Applications” Volume: 03; Issue: 03; Pages:1152- 1161 (2011)

- [15]. Qi. Zhang •Lu. Cheng, Raouf Boutaba, “Cloud computing: state-of-the-art and research challenges”, “The Brazilian Computer Society”, April 2010.

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