Survey Paper on Cloud Computing

Palvinder Singh

M-Tech Student
Department of Computer Science & Engg.
Geeta Institute of Management & Technology, Kurukshetra

Er. Anurag Jain

Assistant Professor
Department of Computer Science & Engg.
Geeta Institute of Management & Technology, Kurukshetra
anuragjain@gimtkkr.com

Abstract - Cloud computing is a new computational model which is primarily based on grid computing. Cloud computing are often outlined as a computing surroundings wherever computing wants by one party are often outsourced to a different party and once would like be arise to use the computing power or resources like information or emails, they will access them via web. This paper is for anyone who will have recently detected regarding cloud computing and desires to grasp a lot of regarding cloud computing. During this paper, we described Cloud Computing, Architecture of Cloud Computing, Characteristics of Cloud Computing, and different Services and Deployment model of Cloud Computing.

Keywords - Cloud computing, On Demand computing, Distributed computing, Data center

I. INTRODUCTION

Cloud Computing provides a surroundings for resource sharing in terms of ascendance frameworks, middleware's and application development platforms, and business applications. The operation models of cloud computing grasp free infrastructure services with value another platform services, subscription-based infrastructure services with supplemental application services, and free services for sellers but sharing of revenues generated from shoppers [1].

The term Cloud Computing has been out lined in some ways by analyst corporations, academics, business practitioners and IT corporations. Clouds is an over sized pool of simply usable and accessible virtualized resources. These resources may be dynamically reconfigured to regulate to a variable load (scale), permitting additionally for an optimum resource utilization [2].
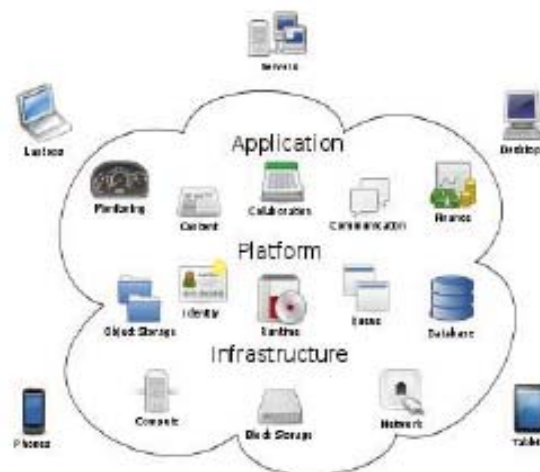

Figure 1. Cloud Computing [2]

There is no doubt that cloud computing is that the most famous topic in IT business. Google, Amazon, Yahoo and alternative web service suppliers, IBM, Microsoft and alternative IT vendors have imply their own cloud computing

strategy, numerous medium operators are have place an excellent deal of attention on cloud computing, the terribly low price of cloud computing platform becomes the main focus of the business.

II.   ARCHITECTURE OF CLOUD COMPUTING

Cloud computing system can be divided into two sections: the front end and the back end. They each area unit connected with one another through a network, sometimes the net. Front is what the consumer (user) sees whereas the rear end is that the cloud of the system. Face has the client's laptop and therefore the application needed to access the cloud and therefore the back has the cloud computing services like numerous computers, servers and information storage [3].

A.   Architectural layers of cloud computing

The architecture of a cloud computing can be categories into four layers:

The Physical layer, the infrastructure layer, the platform layer and the application layer, as indicated in Figure 2.
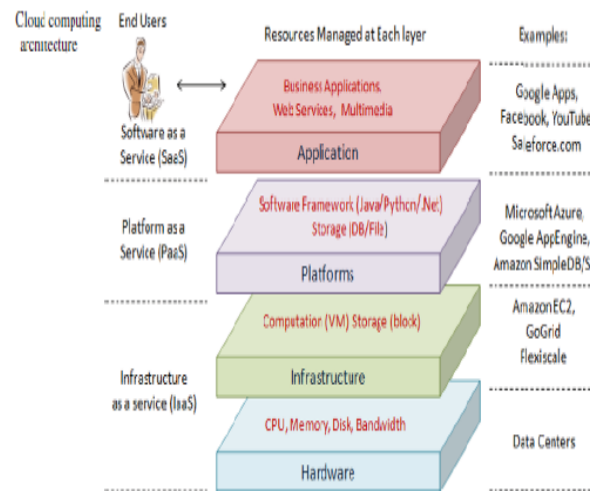

Figure 2. Architecture layers of cloud computing [4]

i.   The Hardware layer:

The hardware layer is responsible for dealing with the physical assets of the cloud, including routers, servers, switches, cooling systems and power.

ii.   The Infrastructure layer:

The infrastructure layer is also called as virtualization layer. The infrastructure layer makes a pool of storage capacity and computing resources by partitioning the physical resources using virtualization technologies such as KVM and VMware.

iii.   The Platform layer:

The platform layer based on top of the infrastructure layer, and this layer comprises of operating systems and requisition structures.

iv.   The Application layer:

The application layer comprises of the actual cloud provisions, for e.g. Business Applications, Multimedia & Web Services [4].

B.   Service Models of Cloud Computing

Cloud Computing has various different service models such as Infrastructure as a Service (IAAS), Platform as a Service (PAAS), and Software as a Service (SAAS).

   i.   Infrastructure as a Service (IAAS)

Cloud consumers can directly use IT infrastructures (processing, storage, networks, and other fundamental computing resources) provided in the IaaS cloud. Iaas cloud provides "Virtualization" in order to integrate/decompose physical resources in an ad-hoc manner to meet growing or shrinking resource demand from cloud consumers. An example of IaaS is Amazon's EC2.

   ii.   Platform as a Service (PAAS)

PaaS provides a development platform that supports the full "Software Lifecycle" which allows cloud consumers to develop their cloud services and applications (e.g. SaaS) directly on the PaaS cloud. The main difference between SaaS and PaaS is that SaaS only hosts completed cloud applications whereas PaaS offers a development platform that hosts both completed and in-progress cloud applications. Example of PaaS is Google AppEngine.

   iii.   Software as a Service (SAAS)

Cloud consumers can release their applications on a hosting environment, which can be accessed through internet from various clients (e.g. web browser, PDA, etc.) by application clients. Examples of SaaS are SalesForce.com, Google Docs, and Google Mail.

III. CHARACTERSTICS OF CLOUD COMPUTING

- In cloud computing, users access the information, applications or the other services with the assistance of a browser notwithstanding the device used and also the user's location. The infrastructure that is mostly provided by a third-party is accessed with the assistance of web. Price is reduced to a major level because the infrastructure is provided by a third-party.
- Less IT skills are needed for implementation.
- Reliable services are often obtained by the employment of multiple sites that is appropriate for business continuity and disaster recovery.
- Sharing of resources and prices amongst an outsized assortment of users permits economical utilization of the infrastructure.
- Maintenance is simpler just in case of cloud computing applications as they have not been put in on every user's pc.
- Pay per use facility permits activity the usage of application per shopper on regular bases.
- Performance is often monitored and so it's ascendible.
- Security is often pretty much as good as or higher than ancient systems as a result of suppliers are able to devote resources to resolution security problems that several customers cannot afford. However, security still remains a crucial concern once the information is sort of confidential [6].
- Cloud could be a massive resource pool that you just should buy in keeping with your need; cloud is simply like running water, electric, and gas which will be charged by the quantity that you just used.
- Cloud computing makes user get service anyplace, through any reasonably terminal. The resources it needed return from cloud rather than visible entity. Users will attain or share it safely through a simple method, anytime, anywhere. Users will complete a task that can't be completed in an exceedingly single personal computer [7].

IV.   DEPLOYMENT OF CLOUD COMPUTING

Clouds can generally be deployed according to the owner of the Cloud data centers. A Cloud atmosphere will comprise either one Cloud or multiple Clouds. Thus, it can often be distinguished between single-Cloud environments and multiple-Cloud environments. The subsequent subsections give a classification of single cloud environments consistent with the Cloud information centre possession and a classification of multiple-Cloud environments consistent with which sort of Clouds area unit combined (see figure 3) [8].
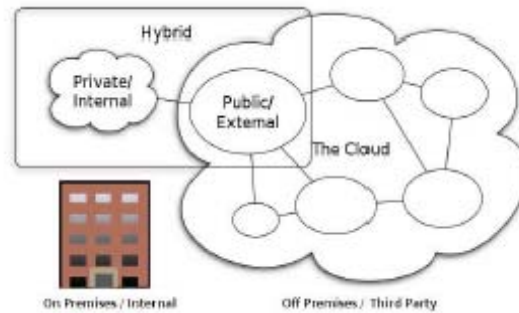
Figure 3. Cloud Computing Deployment model [8]

a. Public cloud

In public cloud, users access to the services victimization external interfaces which may be offered by internet browsers via web. The users share a standard cloud infrastructure and that they don't seem to be intimate it. though public clouds square measure rather less secure, they're terribly advantageous in costs. For those organizations that cannot afford huge IT investments and do not have a lot of confidential information, public cloud appears to be an honest selection [9].

b. Private Cloud

A private clouds operation is inside associate organization's internal enterprise information center. The most advantage here is that it's easier to manage security, maintenance and upgrades and conjointly provides additional management over the preparation and use. Non-public cloud is often compared to computer network. Compared to public cloud wherever all the resources and applications were managed by the service supplier, in camera cloud these services square measure pooled along and created out there for the users at the structure level. The resources and applications square measure managed by the organization itself [10].

c. Community Cloud

A community cloud is a collaborative effort made for sharing infrastructure between multiple organizations. It forms into a degree of economic scalability and democratic equilibrium. The community cloud is managed and secured by all the participating organization or by a third party service provider.

d. Hybrid Computing

Hybrid cloud is a combination of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds) [11].

V. CHALLENGES OF CLOUD COMPUTING

Based on a survey conducted by IDC in 2008, the main challenges that forestall Cloud Computing from being adopted square measure recognized by organizations square measure as follows:

A. Security:

It is clear that the safety issue has competed the foremost necessary role in preventive cloud computing acceptance. No doubt, golf shot your information, running your software system on somebody else's magnetic disc victimization somebody else's hardware seems frightening several. Well-known security problems like information loss, phishing cause serious threats to organization's information and software system. Moreover, the multi-tenancy model and therefore the pooled computing resources in cloud computing has introduced new security challenges that need novel techniques to tackle with. For instance, hackers will use Cloud to arrange as Cloud typically provides a lot of reliable infrastructure services at a comparatively cheaper worth for them to begin an attack.

B. Cost Accounting Model:

Cloud customers should think about the tradeoffs amongst computation, communication, and integration. Whereas migrating to the Cloud will considerably scale back the infrastructure value, it will raise the price of information communication, i.e. the value of transferring an organization's information to and from the general public and community Cloud and therefore the cost per unit of computing resource used is probably going to be higher. This downside is especially distinguished if the patron uses the hybrid cloud preparation model wherever the organization's information is distributed amongst variety of public/private (in-house IT infrastructure) clouds. Intuitively, on demand computing is sensible just for hardware intensive jobs [9].

C. Charging Model:

The elastic resource pool has created the value analysis lots additional difficult than regular information centers, which regularly calculates their price supported consumptions of static computing. Moreover, associate degree instantiated virtual machine has become the unit of analysis instead of the underlying physical server. For SaaS cloud suppliers, the value of developing multi residency among their giving is terribly substantial. These include: re-design and improvement of the package that was originally used for single-tenancy, price of providing new options that afford intensive customization, performance and security improvement for coinciding user access, and managing complexities induced by the higher than changes.

D. Service Level Agreement (SLA):

Although cloud customers don't have management over the underlying computing resources, they are doing got to make sure the quality, convenience, responsible, and performance of those resources once customers have migrate their core business functions onto their entrusted cloud. In alternative words, it's important for customers to get guarantees from suppliers on service delivery.

E. Cloud Interoperability Issue:

Currently, every cloud giving has its own approach on however cloud clients move with the cloud, resulting in the "Hazy Cloud" development. This severely hinders the event of cloud ecosystems by forcing marketer protection that prohibits the flexibility of users to decide on from various vendors at the same time so as to optimize resources at completely different levels inside a company. a lot of significantly, proprietary cloud arthropod genus makes it terribly tough to integrate cloud services with Associate in Nursing organization's own existing bequest systems (e.g. Associate in Nursing on-premise knowledge centre for extremely interactive modeling applications in an exceedingly pharmaceutical company).The primary goal of ability is to comprehend the seamless fluid knowledge across clouds and between cloud and native applications [12].

VI. CONCLUSION

Cloud computing is a new technology wide studied in recent years. Currently there are several cloud platforms that are employed in each in trade and in educational. The way to use these platforms could be a huge issue. During this paper, we have a tendency to delineate the definition, styles, and characteristics of cloud computing, cloud computing services, readying model and challenges of cloud computing. There are several issues in cloud computing. As an example of cloud computing issues is ability, Performance, Service Level Agreement (SLA), knowledge Confidentiality and measurability, knowledge Integrity, Load equalization, Synchronization in numerous clusters in cloud platform, and standardization, the protection of cloud platform.

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