iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** V **Month of publication:** May 2020

DOI: http://doi.org/10.22214/ijraset.2020.5054

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

Introduction to Cloud Computing

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Abstract: Cloud computing is an online platform where we can easily get our data from database with the help of network services such as 'Internet'.
It provides on demand service to the client. Data storage is among one of the primary services of the cloud. Cloud computing is a paradigm for delivering the IT where rapid provisioning is an important factor for computing resources and data application in an IT sector.
It provides several cloud services such as "SaaS, PaaS, IaaS" to the clients. It allows using application without access and installation their personal files on computer with internet access because of which data storage and processing become more efficient.
Keywords: Cloud computing, Data storage, Internet, SaaS, PaaS, IaaS.

I. INTRODUCTION

In the modern day's, cloud computing becomes more efficient because it acquires less time, cost saving, reliable to the users, highly scalable, and provides unlimited storage capacity to the client. It provides several platforms that support innovation to deliver the environment that is highly scalable and reliable. Here large number of devices or systems are connected in private and public networks, to provide infrastructure for application, data and file storage.

Cloud provides high speed internet, to access our data from any location throughout the world. Cloud computing becomes more popular in the period of (2004-2010), where the people around the world start exploring the things in an efficient manner, to enhance their knowledge in the respective fields of interest. It provides several platform for data storage such as GoogleDrive [1], Dropbox [2], Apple iCloud [3], for storing larger data on the cloud. There are some challenges to the cloud such as data protection, data recovery and availability, regulatory and compliance restrictions, which may become harmful to the user's database stored on the storage platform.

Earlier in the late 1990's, work has been done on utility based computing, in which services are provided on the pay-use basis. In this, there is a need to spend some money for getting information from the server. To resolve this problem, use of cloud based computing services came into existence in accordance to achieve the success in the field. Cloud is the extention of internet with some extent vision of computing.

According to the report [7]. This statistic presents the number of consumer cloud-based online service users worldwide. In 2018, approximately 3.6 billion internet users are projected to access cloud computing services, up from 2.4 billion users in 2013

II. CLOUD COMPUTING ARCHITECTURE

Here, Server and client communicate with each other over the internet.

On the client side there is a cloud infrastructure:-

A. It consists of client part of the cloud computing systems.
B. It consists of some application and interfaces that are required to access the cloud computing platform such as web browser.

There are 7 components on the server side also:-

1) Application, provides application for storing data on the server side.
2) Services, provides services for exploring the things.
3) Storage, provides unlimited storage capacity for the users.
4) Security, provides security mechanisms to handle the privacy related issues.
5) Infrastructure, provides platform, for getting correct information from the server.
6) Cloud runtime, provides runtime environment for accessing the site.
7) Management, provides mechanisms to manage these activities.

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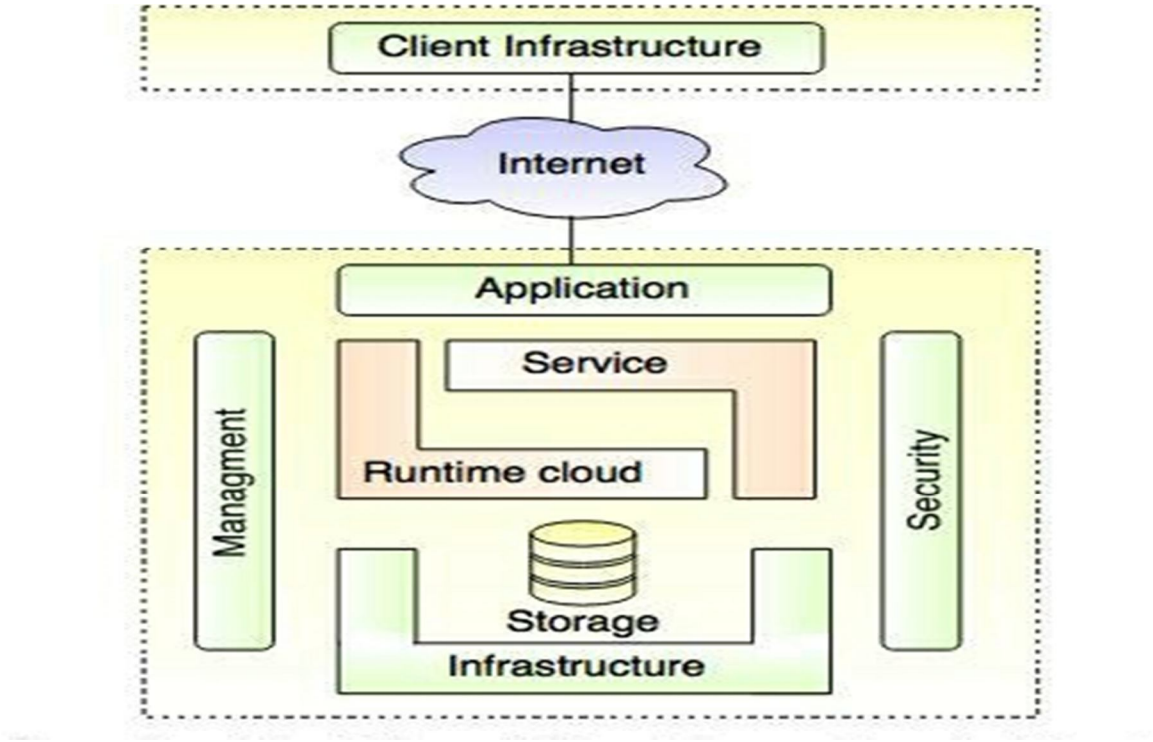

Figure 1 : Cloud Computing Architecture

III. ADVANTAGES OF CLOUD COMPUTING

1) *Cost Saving:* It is cost saving because it acquired minimum cost to the client for their requirements.
2) *High Speed:* It provides high speed services to the user's.
3) *Time Saving:* It required less time to complete it's task.
4) *Reliable:* It is reliable to the client because, it gives accurate information about any queries.
5) *Highly Scalable:* It provides highly scalable services to the cloud consumers to fulfill their needs.
6) *Storage:* Cloud computing provides unlimited storage capacity for the users.

IV. CLOUD CHALLENGES

There are several challenges to the cloud. Some of the issues are as follows:-

1) *Security Issues:* Some of the security issues are faced by cloud are as follows:-
a) Data Integrity, allows the users to access the data from any place and any time. Thus there is a lack of data integrity in the cloud.
b) Information Security, is related to the exchange of information between the hosts and user. This may leads to the theft of information.
2) *Internet Connection:* Good internet connectivity is essential to the cloud clients for accessing the information easily without any interruptions. We can't access cloud services without having a internet connection.
3) *Data Issues:* It includes various data issues such as:-
a) Loss of data.
b) Loss of data location.
c) Data integrity.
d) Deletion of data.
4) *Performance Issues:* There are various performance issues in cloud computing are as follows:-
a) Poor application performance, includes hanging of application during the task performed. This may lead to loss of information.
b) Low Bandwidth, due to low bandwidth, speed of the application may vary. This will cause the lost of connection.

Figure 2: Cloud Security Challenges

V. COMPONENTS OF CLOUD

1) *Cloud Consumer:* Cloud service consumer also known as clients or end users which interact with the systems and acquired services as per their requirements.

The clients are further classified in three broad categories:-

a) Mobile Clients, are those who can run their application from laptop, PDAs and smart phones. This level of clients demand high speed internet.

b) Thin Clients, are those who doesn't have any hard drive or DVD ROM, they are totally depends on the cloud servers.

c) Thick Clients, are self-sufficient in terms of accessories.

2) *Cloud Service Provider:* Cloud service provider are the agent who hosts the servers and provides the services to the cloud consumers.

a) The major cloud service providers are Google, Amazon Web Services, Salesforce, IBM, Microsoft and Rackspace.

3) *Internet Medium:* Internet medium is the communication channel between the cloud consumers and service provider.

4) *Datacentre:* Datacentre is also known as server farm. Server farm is the collection of thousands of servers [4]. It consists of data storage, network and server.

VI. EVOLUTION OF CLOUD COMPUTING

1) *Grid Computing:* Grid computing was introduced in the early 1960's. This Era is also known as evolution of cluster computing.

2) *Utility Computing:* Utility computing was introduced in the late 1990's. In this type of computing the services are provided on the pay use basis.

3) *Software as a Service (SaaS):* It is totally based on the network service providers. It was introduced in the late 2000's . It was gained momentum in the period of (2001-2005).

4) *Cloud Computing:* It was introduced in the late 2010's. It is an online platform for storing data over it, and gained information through the medium of Internet'.

a) It provides on demand services to the users.

b) Data storage is among one of the essential services of the cloud.

Figure 3: Evolution of Cloud Computing

VII. LATEST CLOUD COMPUTING TECHNOLOGY

1) *Omni-Cloud:* Omni-Cloud is a type of cloud technology in which there are multiple clouds are associated[5]. In modern day's, Omni-cloud is in trends. It can deploy multiple Infrastructure as a Service providers at a time.
2) *Serverless Computing:* In this, the application can building and run without having any servers. It provides backend services to the users of cloud. Serverless model has a conventional structure that uses a "pay as you go" systems.
3) *Quantum Computing:* Provides the authority to the computers and service providers to process data at high speed with the current techniques available to the cloud.
4) *Kubernetes:* It is an online platform used by larger organization or company for getting essential operational needs and abilities. It was designed by Google and now organized by Cloud Native computing organization.
5) *Internet of Things:* Internet of things is a platform that interconnected with the computing devices, digital machines with the help of unique identifier (UID's)[6]. It does not acquired any human to human or human to computer interaction.
6) *Artificial Intelligence:* It is an area of science and technology that works on creation of intelligent machines that works like human's. The goals of artificial intelligence are as follows:-

a) It is used to create the expert systems.
b) It also used to implement human intelligence in the machines[7].

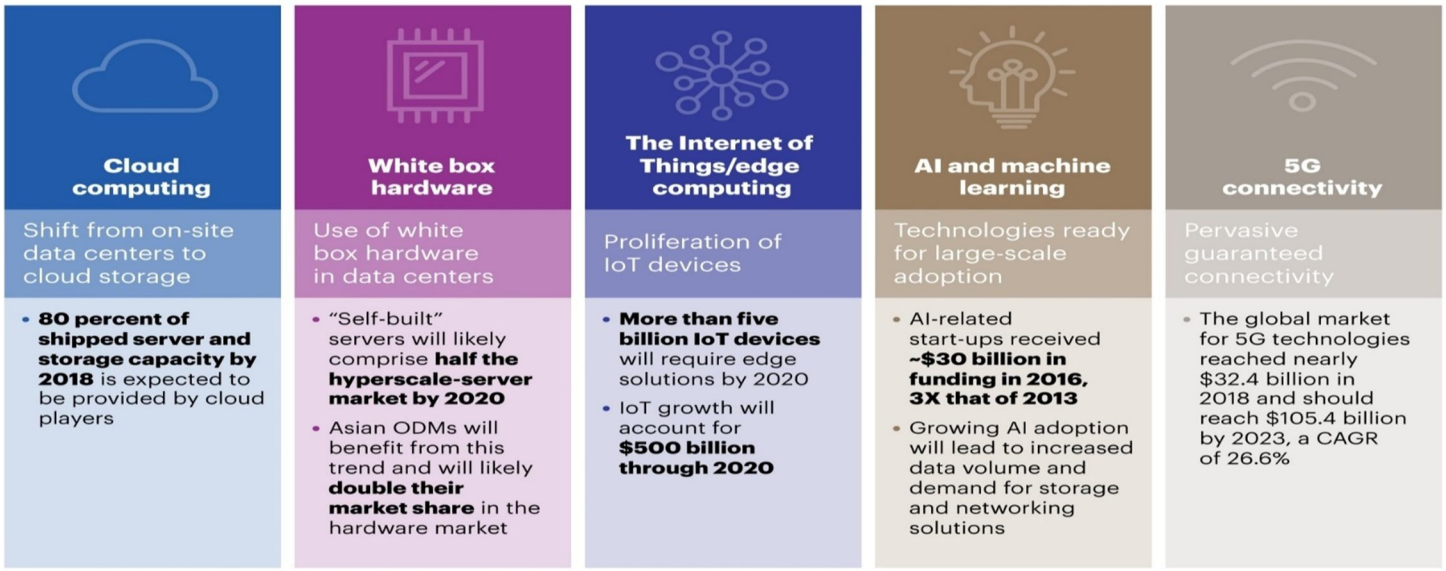

Figure 4: Latest Cloud Technology

VIII. CONCLUSION

Cloud computing provides on demand self services. It provides easy availability of resources for the cloud users. It allows users to access the network services in a very large amount. The servers are easily maintained. It allows users to buy extra cloud storage if they needed for very small amount. It provides transparency to the hosts as well as customers. Cloud computing resources are designed to support a multi-tenant model. Multi-tenancy allows multiple customers to share the same applications or the same physical infrastructure while retaining privacy and security over their information.

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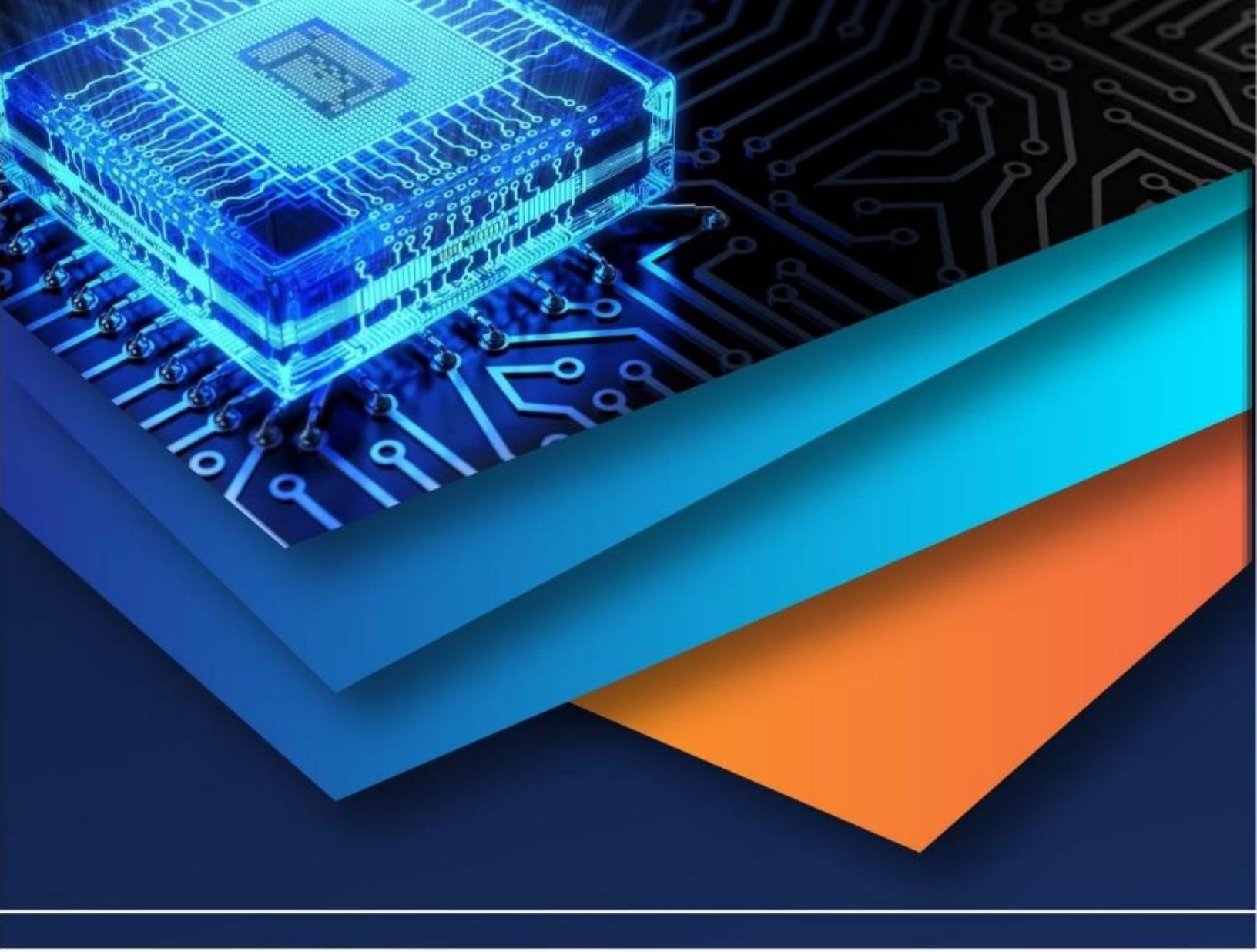

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