Cloud and mobile computing: the age of virtual internet space

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Abstract. This century is described as Cloud Computing Technology over the Information Technology Business. Cloud computing advancement mostly relies on the Internet possesses the most advanced planning of computation. It records as piles of correlated and schmoozed hardware, software, and internet infrastructure. It blends grid computing and other computing as a community. A short overview of cloud computing is obtained from this research paper by consulting several papers on cloud technologies. The substance conveyed by this represents the perspective of shaping IT businesses and the idea of cloud computing.

Keywords: Cloud tech, Software as a Service, Platform as a Service, Infrastructure as a Service, Cloud Computing platform, Mobile Cloud technology.

1. Introduction

The stint cloud over cloud storage describes a series of countless connections, comparable to the physical clouds found in the atmosphere containing droplets of water. Years back, in the 1960s, cloud technology developed and is now evolving at a fast pace. In the 1960s, John McCarthy spoke at the Massachusetts Institute of Technology, USA, where he said that cloud technology can be ventilated like H2O and electrical consumption and is now evidently experienced. The cloud services are received on a demand and usage basis. The Pay-as-you-go facility offered by the cloud is the most renowned one. There are some constituents of a developed cloud, namely, customer desktops, circulated servers, and data location, which describe the services offered by consumers through their desktops and get services from some data location over the server.

Cloud technology provides users with numerous facilities such as "PAAS,” "SAAS”, and "IAAS." "PAAS” provides platform-related services to build applications and devices to be used by consumers, "SAAS” provides information and workload-related resources, and “IAAS” provides infrastructure-related services to private ventures and works. The cloud infrastructure is a platform, which is evolving and is emerging on quite a good scale. However, there are also some detrimental aspects associated with it, such as security and privacy. When cloud infrastructure develops on a booming graph, consumers face a lot of security and integrity problems. Fraud and data theft have been carried out by intruders for incorrect meaningful reasons for years, thereby impacting the individual's identity. Cloud technology possesses various variants like the private cloud, which offers the best class of security and privacy to users, whereas the public cloud is best suited for large amounts of data and high scalability for developing and initiating new project works. There are other cloud deployment types, such as hybrid cloud technology and community cloud technology, listed for particular uses and clients. Cloud infrastructure is cost-effective and reliable, as, with a minimal amount of investment or currency, a customer often needs to choose the best class service.

Cloud technology is highly scalable, as is mostly availed knowing the fact that this offers scalability or 24*7- accessibility on the go whenever required. The ups and downs over the...
organization’s data are easily managed. Not only this cloud technology offers a great amount of security when compared to the ancient and traditional methods for accessing, processing, and storing the data, but also is more popular in the industry because more secured networking is offered over the cloud technology compared to the traditional ones. The traditional ones are just a paper- pen work and simply pen down on sheets and thus are more prone to lose or stealing from unauthorized users. Not that it has data technology security and also other ways to keep the data secure, but the cloud-based features and merits are more than that, expanding and scaling its divisions across various networks and fields related to this technology-oriented globe.

2. Literature survey
Cloud computing is an upcoming computer network in this developing environment, taking place in diverse ways and "Mobile Cloud storage" is one of those types. Mobile Cloud technology is a combination of the related features of cloud technology, mobile technology, and wireless featured networks from the three identified systems. The identified utilities, the cloud operations, and the related mobile operations have changed the individual's lifestyle. These jointly make one avail of the services of both the emerging cloud technology and the existing mobile platform, such that mobile platform inherits the cloud services and by just a few clicks, one can access the cloud services over the smartphones. The characteristics associated with mobile cloud technology are just equivalent to the cloud technology as defined pay-per-use, remote access, scalable, and many more, but, they are specified to mobile in particular. This mobile technology jointly with cloud technology provides a set of applications like mobile games(the latest one), mobile payment modes like Paytm, Phonepe, etc. These services can be accessed on a smartphone, which is more powerful as compared to laptops and PCs.

It states that emerging cloud technology is associated with mobile platforms [1]. Cloud technology is a vast emerging technology in today's virtual world. In this research document, it is mentioned about data storing and space in cloud computing, security issues associated with cloud technology, applications in cloud technology, and to some extent information regarding the cloud. It defines the block and files storage schema in cloud technology. Securities issues are still there in cloud technology knowing the fact that cloud is a very mature technology still security is compromised as in the public cloud and a little bit in private also. Reliability, privacy, interoperability, and high computing configurations are some major issues connected to cloud technology [2]. Here a brief knowledge revolving around cloud technology is defined and the applications, challenges, emergence of cloud in the new modern era industries, and automation. Some benefits corresponding to cloud technology is cost-saving and enhanced secure network and pliable nature of cloud [3]. Thus to associate cloud platform with education platform there, the use of cloud in the field of education management is booming. Comparing traditional education with the latest one there is a smart change enabled in cloud technology for education. Like most are aware of online education that helped a lot in the COVID-19 lockdown period. So this kind of education has been made possible through cloud applications as MSTeams, Zoom, etc. However, there are issues related to cloud education and an effect on privacy, theft attacks, and reliability. Information can be fetched illegally over hacking the platform, though it is an arduous task and requires consistent efforts but still possible [4]. It has been defined as cloud technology and platform, application challenges, and architecture associated with it.

A brief of SAAS, IAAS, PAAS, the architecture model of cloud technology, and the Demand platform of cloud technology have been mentioned like the NIMBUS, ABICLOUD, EUCALYPTUS, etc. Also, issues like reliability, privacy, compliance, availability are stated [5].

3. Cloud in mobile and the associated threats
Here a demo or conceptual demonstration of security associated mechanism is proposed that will lead to minimization of internal data thefts. The mechanism defined for enabling the security directly revolves around prevention of data thefts done right from self or inside platform. It was made possible to achieve it by making use of two distinct technologies blend together. They are stated as USER
PROFILE MANAGEMENT associated with OFFENSIVE DECOY TECHNOLOGY. These defined approaches will make us able to avert the inside data related attacks. The defined approach that is USER PROFILE MANAGEMENT guarantees about the user’s conduct and patterns associated to it are recorded and kept. The other part of blend or mixture enables the applications to store lure data and false information in a file managed system to avoid or betray insider data stealers. Whenever an intruder or false insider takes an access to cloud, they are moved towards they decoy folder and data. This happens as that false identity user or the malicious software will always try to take over the fragile information which the betray/decoy folder depicts to have. That is why the malicious intruder always desires movement through decoy folder which will provide sufficient amount of proofs about the false identity who entered the cloud file. The pragmatic output thus ensures that the defined security model will effectively detect the harmful intruder who entered for purpose of stealing data or affecting the privacy. This paper did not focus decoy information of pertaining to many domains such as banking, insurance, health care and so on. Moreover the user profile management can be improved further to have hierarchy of attributes of user data.

This proposed mechanism will be achieved by enabling DISINFORMATION ATTACKS. This defined method inhibits the intruder’s inside attacks for stealing data. The specific user or customer who has an access for viewing cloud information of their own personal data and able to perform data related modifications possess some mentioned pattern for usage trend. Such type of users are defined or termed as NORMAL USERS. The first phase is to profile the user’s behavioral trend. Then comes the process of storing decoy data in a defined file system besides of many thrown society equations. The inside intruder generally does not possess behavior as of associated to normal user. That is why the intruders are attracted towards decoy file. The decoy or betray data is just a fake or dummy of the real one and will not affect anything if it is stolen. But here the navigating trend of intruder can be compared with the navigating trend of normal user. Thus it is quite important to examine the anomalous trend and activities. Whereas the genuine person or cloud user acts normal thus his activities resembles to the general one.

Mobile cloud technology is the emerging technology in the science related field and is quite potential when it comes to various fields associated to it. Whether it is storage, data access, OTTs and many other cloud related features cloud will help the mobile phones to operate as smart phones. Cloud technology helps to merge, store, operate and access the data and information over the cloud. No storage of data in phone is fairly a decent option. The mobile phones or the users communicate with the other users with the help of base stations and access points. All the data is processed and accessed through a single computing unit. There are numerous applications and features of mobile cloud technology.

a) Like the image processing for analyzing and examine a given picture or image. The image is processed and analyze further.

b) Natural language processing (NLP) is also one of the great feature. Which works in the field of voice and sentence processing demand.

c) Allocation of GPS (Global Position System) is again a tremendous feature which enables us to share our data over peer and groups over the cloud platform.

d) Social network and applications is a collection of various social media sites and applications accessed over various countries and positions.

The mobile cloud technology offers identical characteristics as of cloud technology but here comes the addition of mobile phones with the cloud technology and thus establishing it more flexible and elastic. Figure 1 shows how the cloud is accessed over the mobile devices to get the services.

I. The mobile cloud platform is quite scalable as the resources can be increased and decreased depending on the demand and requirements.

II. This blend of mobile phones and cloud technology develops a broad access network for the users and developers to communicate with much less hassle.
III. Location liberation as a user can experience this in our daily to daily routine and life. It can be accessed cloud based applications, services like OTTs, google maps, gmail etc. so these all are independent of locations or position what a user need is just an internet or broad band connection.

Figure 1. Schematic of how the cloud is accessed over the mobile devices to get the services.

4. Certain security and privacy platform for securing the system
The must concern for the information stored at some location is integrity. It is to ensure that the data is free of redundancy and any errors. So mobile cloud technology maintains this for the user. Authentication plays a major role in securing the data from any intruder attacks. So mobile cloud computing principally ensures the authentication process of user while logging in the system. Digitally established rights and policies to govern the e-data and to protect data from piracy and fraudlents. Encryption and Decryption is implemented in data protecting process.

5. Advantages and disadvantages of mobile and cloud technology
Table 1 describes the some advantages and limitations oriented to mobile cloud computing.

6. Mobile cloud technology features
The upcoming generation and era are truly based on online or e-business. Organizations strive to find an operational means of moving their organizations over the internet. So mobile and cloud technology contribute and spreads its branches in the e-commerce arena. In daily lives, one can experience this in trading and business; applications installed in smartphones for businesses to sell and buy to trade in the stock market. By blending mobile and cloud technologies, companies will be more influential and smart. Mobile cloud technology delivers various services like fetching resources on requirement and demand.

To integrate mobile commerce into the cloud infrastructure, a number of algorithms and tools have been developed. Recommendation algorithms and tools are one of those algorithms in which the device employs math-based computational approaches and analyses data from past transaction records centered on the user’s contact number used as a crucial aspect for performing transactions and the user’s contact number will be in use for each and all transactional operations and the key will also be used as making ratings for services and feedback on the products over a regular interval of time.

7. Mobile cloud technology applications
Mobile cloud billing: The mobile cloud technology works immensely when implemented in a payment gateway and billing facilities. Thus leading to save time and better experience. Online purchasing and e-tracking of shipments: Mobile cloud technology helps the user to track and examine the details of shipments and orders purchased.
Table 1. PROs and CONs of Mobile Cloud Technology.

| PROS                                                                 | CONS                                                                 |
|---------------------------------------------------------------------|----------------------------------------------------------------------|
| Spreading Batteries Life-Time: If compared to desktops or laptops the battery consumption of mobile phones is quite less and scalable. Process done on a mobile cloud will consume less battery as compared to the same process done on laptops. | Lower Range or Bandwidth: The mobile cloud technology comes with a limitation of lower range and accessibility over different regions and remote locations. In remote areas network, connections fail to reach the end-to-end points thus difficult in accessing the cloud. |
| Resources Allocated Dynamically: In a mobile cloud data can be stored and retrieved very easily rather than switching on the laptop and then searching for the applications and then resources. A mobile phone is quite flexible to manage. | Susceptible To Intruder Attacks: The mobile cloud technology is quite prone to online data hack attacks for significant stealing of fragile information of users. |
| Multi-Tenant: This mobile technology is designed as a platform where multiple users and customers can share and work on a single allocated resource. Thus leading a group-based work and saving resources. | Vulnerable Environment: The privacy and security issues always arise in a mobile cloud environment as the essential information is at high risk of getting attacked and hacked. |
| Scalability helps the small businesses to grow on large scale and make the resources available for organizations on demand basis. | Performance: Mobile lacks behind when it comes to speed and processing power thus affecting the cloud services too. |
| More and more features available on smart phones make business easy and operational and allows user or owner to perform transactions online sitting anywhere. | Privacy related issues: In mobile cloud services the important information is more vulnerable to prone or intruder attacks. |

8. Cloud computing services for accessing mobile networks location

These days, LOCATION BASED SERVICES (LBS) technology is more popular and is in trend and is basically implemented over the smart-phones owned by the customers scattered all across the globe. Due to sharp increase in the graph of smart-phones owner this technology has been developed. This kind of technology offers customer accesing their current locationing position for better services. Some issues related to security and privacy were raised over this technological advancement as nothing is perfect in this world but security is one of the main issue. It was taken to considered this system into use if it offers protection of temporary data, identity of the customer, and secutityoffereance to some private data. Security issues were resolved using the Time-Triggered Protocololand many more.

9. Why and why not cloud computing?

In this world growth is possible through many ways. But shining in industries field whether it is automation, research, robotics and many other departments they need cloud computing for their speedy growth in this cut throat competitive world. So MNCs and many organizations have switched to cloud for saving resources and optimizing their work. Cloud can be expensive and free depending on its nature and usage. According to many, cloud have made their working capabilities higher than before. In most of the car manufacturing units and plants use of artificial intelligence has gradually increased. Artificial intelligence is also a part of cloud computing. If we look for job availabilities, employment in the field of cloud computing is very high but need for highly skilled technicians are in demand only. With the increase of data and information generation, storage matters a lot so cloud is the easiest and simplest way to store rather than pen downing it on paper. For some organizations affording cloud is not easy(private cloud) and they have to compromise with security so it has some
demerits too. Public clouds are not that much safe and users have to face security issues. Learning cloud is also not everyone’s cup of tea so the person have to be adaptive in nature. Many more explanations are there for cloud computing for its pros and cons.

10. Cloud technology vs traditional methods

Table 2. Distincts the cloud technology and traditional ways.

| CLOUD TECHNOLOGY                                      | TRADITIONAL WAYS                                      |
|--------------------------------------------------------|-------------------------------------------------------|
| It offers more space and security                       | It offers less space and less Security                 |
| It is more cost effective and easy                      | It requires more money and Difficult to handle         |
| Security and privacy is the main advantage of cloud     | Security and privacy are the major concerns            |
| technology                                             |                                                       |
| It is more often reliable                               | It is an outdated method                              |

In addition to Table 2 from which the comparisons can be done, there are several more features. As the successor is primarily the progress of the predecessor. It excludes the loopholes in the predecessor from the successor. And here, when the challenges and problems related to the conventional method came into the eyes of clients and technocrats, cloud was created.

11. Conclusion

The emergence, evolution, forms, and different components of cloud computing, why and why not choose cloud computing for reasons are illustrated in this review article. Any areas where cloud computing is widely used have boomed at a very fast speed. Also, different approaches to cloud computing and some of their advantages are mentioned. The application and research area of cloud computing will continuously be shining. At present approximately many small and big industries have switched to cloud computing to manage storage, traffic, hardware requirements. So, it is clear that there is a major impact of cloud computing on society and the business world. Firms have started shifting towards cloud usage rather than the traditional paper works. The integration of mobile cloud technologies into the virtual world seemingly has a huge effect on the way companies operate, and do e-business.

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