



MOBILE CLOUD COMPUTING FUTURE AND CHALLENGES

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Abstract

Mobile cloud computing is the combination of mobile computing and the cloud computing which combines the features of mobile computing and the cloud computing, cloud computing is the use of computing resources which are available in a remote location and accessible over a network. Here the resources are available over the network instead of user's site. Mobile cloud computing as a form of service provider, this has several concepts like 1. IaaS Infrastructure as a service 2. PaaS Platform as service 3. SaaS Software as a service.

Since the increasing demand of Mobile computing and cloud computing the combination of both heading towards new era that is mobile cloud computing. This paper discusses the mobile cloud computing future and the challenges.

Key Words: Mobile Cloud Computing, Challenges

Introduction:

The analysis of the impact of mobile computing on the various services shows how the mobile computing has changed each service. As mobile computing has become more popular over the past decade, it has been under continuous development with advances in hardware, software, and network. Mobile computing has various applications in our everyday life. Use of this technology has become a fundamental skill. With mobile computing we can check our email messages, our bills, our bank accounts, and our other private information just by using a mobile phone or laptop anywhere. All the functionalities obligate each exchange data to make it safe and immune from any attack. Mobile computing services have simplified our lives.

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network. The name comes from the common use of cloud shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation[1].

Mobile cloud computing is the combination of cloud computing and mobile networks to bring benefits for mobile users, network operators, as well as cloud providers. Cloud computing exists when tasks and data are kept on the Internet rather than on individual devices, providing on-demand access. Mobile cloud computing can involve other mobile devices and/or servers accessed via the Internet[2]. A related notion is cloudlets, which has been viewed in different ways[3]. In Mobile cloud computing the foundational hardware consists of mobile devices. Mobile cloud computing as a form of service provider, this has several concepts like 1. IaaS Infrastructure as a service 2. PaaS Platform as service 3. SaaS Software as a service.

Cloud computing means that mobility will be an integral characteristic of computing in the very near future. It will be through computing, that end users experience the advantages of computing delivery models like SaaS and Cloud computing. Mobile phones on a cloud based solution, and wireless broadband service provider believes the advent of faster, more sophisticated networks will unleash the full power of cloud computing. Cloud computing is use of web based computer technology. There are some cloud based services towards the business application side. Which define the SaaS market. The most well-known player in this category is Salesforce.com with its sales-related applications set: however, there are also other companies such as Success factor in the same league. Some collaboration services are email service like Gmail is a cloud based email service.

2. CLOUD COMPUTING SERVICES

2.1 Infrastructure as a service (IaaS)

The first service model, which is called 'infrastructure as a service', is based on the provisioning of computing resources which are more hardware oriented. According to NIST the provisioning of "processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications", from fall under this category. With infrastructure as a

service, the user is able to run and manage own operating systems including applications by using virtualization technologies. Furthermore he can make use of storage systems and/or network devices like e.g. firewalls. The management of the underlying infrastructure is done by the service provider of the cloud, though the user has full control over operating systems, applications and storage and eventually partial control over network devices.

2.2 Platform as a service (PaaS)

The second service model, which is called 'platform as a service', gives users the opportunity to run applications on the infrastructure offered by the service provider. However, It requires that the applications are created with programming languages or tools that are supported by the service provider. The management of the underlying infrastructure and operating systems is in the hands of the service provider. Though the user has full administrative control over the applications he wants to host on the cloud system.

2.3 Software as a service (SaaS)

The third service model, named 'software as a service' focuses on the provisioning of applications. The management of the underlying infrastructure, operating systems and even the configuration of the application itself (with exemption of some partial elements) is completely done by the service provider.

3. MOBILE CLOUD COMPUTING IS THE FUTURE:

Mobile Cloud Computing mean it refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device. Mobile cloud computing applications including mobile Gmail, Google Maps, and some navigation apps[4].

iPhone/ iPod touch app:

- Access any uploaded file from your mobile phone
- Share with anyone. Using just their mobile phone number
- Search all files in your cloud
- Secure mobile/computer files backup
- Print to any shared printer[5]

Android:

- Android open Handset Alliance is an open source mobile operating

- Android provides an interface to system devices and services through a set of Java Packages, including android O.S. android Hardware, android. Location and android media.
- Easy to access and operate on multimedia data, sensor values, system resource usage data, and location information.
- Android also provides a shell interface, but it lacks many of the missing utilities can be added by installing Busy Box Denys Vlasenko[6]

4. FUNCTIONALITY OF A MOBILE CLOUD COMPUTING:

- i. Global data access
- ii. Distributed data processing
- iii. Fault Tolerance
- iv. scalability
- v. Privacy
- vi. Hardware Interoperability

5. CHALLENGES:

I. Mobile elements are resource-poor relative to static elements. The additional weight, power and size restrictions compared to static counterparts will always have a negative effect on performance and capacity.

II. *Limited energy source of mobile devices:* To change the default, adjust the template as follows. Power capacity of mobile devices is based on their batteries whose capacity is limited so it is very important to maximize the battery life. More and more application execution in the cloud means more battery saving but in general it is not possible to completely transfer the whole application execution to the cloud. For example basic functions like opening of an application, inputting data and displaying result of processing obviously need to run on device. We can just partition application function which is to be offloaded to the cloud and which is to be carried out on device itself. In case of mobile devices energy is basically used for displaying different element and for internet connectivity [7].

2) *Resource poverty of Mobile Devices:* Comparison of desktop pc with any mobile device shows that on what cost this feature of mobility is being achieved. As compared to a fixed device, mobile devices in general have:

3 times less processing power

8 times less memory

5 times less storage capacity

10 times less network bandwidth

So in general we can say that this resource deficiency is one of the major reason for the adoption of mobile cloud computing. In order to overcome this limitation of mobile devices, resources are added to the cloud infrastructure and can be used anytime on requirement, providing a seamless user experience for advanced applications. Even after continuous improvements in mobile device performances , the disparity between the resource constraints of mobile and fixed devices will remain and must be accounted for in the types of application selected for mobile cloud computing [9].

III. Mobility is inherently hazardous. Mobile devices are more susceptible to loss and damage.

IV. Mobile connectivity is highly variable in performance and reliability. Wireless networks vary in speed and reliability, and mobile users constantly move between networks. There is often no network available.

V Mobile elements rely on a finite energy source. Battery power consumption must be considered at all levels for conservation to be effective[8].

6. CONCLUSION:

Since mobile computing is much popular now a days and also people are going towards cloud computing to save the resources so, combination of both leads increasing number of users, Smartphone use in computing are affordable to common people. It has virtually unlimited computing and storage capacity. Mobile cloud application are easier cross platform and allow covering the whole mobile. Mobile application communicate directly to the cloud service itself (SaaS). Mobile environment development are faster than desktop. Wireless broadband network are much faster than landline. Mobile application stores the in the cloud as opposed to on the mobile devices, and the application will become more powerful as processing power is offloaded to the cloud. Mobile apps will communicate directly to the cloud service itself, as opposed to needing the user to launch a web browser and navigate through the mobile web, the advantages of both the technologies and the

combination of both technologies leads to next era i.e. mobile cloud computing the present study also disc used the possible challenges of mobile cloud computing.

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