

Overview of Mobile Cloud Computing

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Abstract: Mobile Cloud Computing (MCC) is a combination of three main parts; they are mobile device, cloud computing and mobile internet. With the help of MCC, a mobile user gets a rich application delivered over the Internet. The capabilities of mobile devices have been improving quickly than computers. Many researchers focus on the area of mobile computing and cloud computing. Cloud computing is the trend in which resources are provided to a local client on an on-demand basis, usually by means of the internet. Mobile cloud computing (MCC) is simply cloud computing in which at least some of the devices involved are mobile. This paper goes over multiple techniques and methods for mobile cloud computing. It explores both general-purpose mobile cloud computing solutions and application-specific solutions. It also discusses instances of mobile cloud computing where mobile devices serve as the cloud rather than the client. Finally it discusses some issues raised by this technology such as privacy and data ownership.

Keywords: Mobile Cloud Computing

I. INTRODUCTION

Cloud computing is defined as the trend in which resources are provided to a local client on an on-demand basis, usually by means of the internet. One of the main benefits of cloud computing is reducing downtime and wasted expenditure for servers and other computer equipment. A given company is required to purchase the minimum amount of hardware necessary to handle the maximum points of stress on their system. Given situations where the strain and traffic are highly variable this leads to wasted money. For example, Amazon.com, a pioneer in cloud computing, at times used as little as 10% of their capacity so that they would have enough capacity to deal with those rarer high strain times.

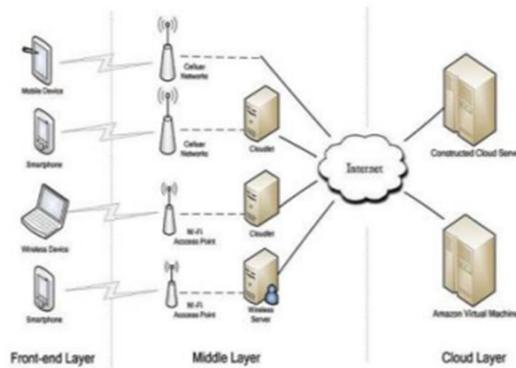


Fig 1. Mobile cloud computing architecture

In the case of mobile cloud computing an additional significant benefit is brought to the table. Many mobile devices have significant constraints imposed upon them because of the importance and desirability of smaller sizes, lower weights, longer battery life and other features. This often severely constrains hardware and software development for these devices. Cloud computing allows devices to avoid these constraints by letting the more resource intensive tasks be performed on systems without these constraints and having the results sent to the device. Thus, cloud computing for mobile devices is a very appealing and potentially lucrative trend. Several methods exist by which this trend can realize itself. First, methods have been proposed which aim to construct general systems for utilizing the cloud to help boost phone performance. This family of solutions can be referred to as general-purpose mobile cloud computing (GPMCC). Second, many individual applications used today with mobile devices such as smartphones employ cloud computing to a greater or lesser extent. There are



multiple methods used and proposed by which the cloud can be leveraged. This can be referred to as application-specific cloud computing (ASMCC). Each of these two approaches has advantages and disadvantages and they are not mutually exclusive. In addition to mobile cloud computing where mobile devices serve as the client and non-mobile devices serve as the server or mainframe, several papers have been written proposing an opposite model. In this model, mobile devices serve as the cloud that can be drawn upon. This paper will outline some work done in this area. Finally, this paper will consider privacy and other concerns related to cloud computing, often specifically to MCC. These issues could cause a barrier to widespread use of mobile cloud computing and methods for resolving these issues could accelerate its ADOPTIONS.

1.1 Future Scope of Mobile Cloud Computing

Mobile computing has grown immensely in recent years and it is projected that in the future, mobile computing will control almost all technological activities in the world. This will be projection will be looked at in this research paper. Mobile simply describes a computing device that is not restricted.

1.2 Literature Review of Mobile Cloud Computing

Collaboration among mobile devices: As the mobile devices have certain resource constraints, there arises a need to get resources from external sources. One of the ways to overcome this problem is getting resources from a cloud, but the access to such platforms is not always guaranteed or/and is too expensive.

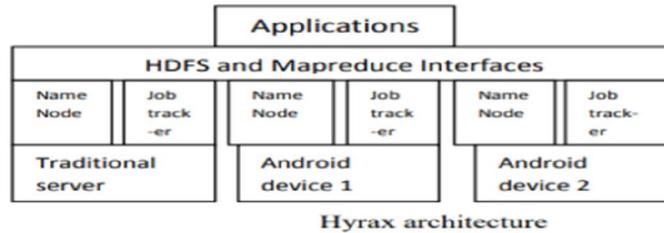
Table 1. Comparison of approaches related to collaboration among mobile devices

Table with 7 columns: Name of approach, Job Distribution Time, Performance matrix, Constraints, Applications used, Advantages, Disadvantages. Rows include Virtual Cloud Computing Framework, Ad hoc and Opportunistic Job Sharing, and SpACCE.

Migrating execution from mobile devices to resource rich platform: Collaboration of mobile devices to work as a unit in a networked environment is a good solution for a common task. But sometimes work cannot be distributed among mobile devices and has to be offloaded to a resource rich platform. For that migration of executable block has to be done. Ricky et'al has proposed stack-on-demand asynchronous exception (SOD_AE) execution mechanism for offloading of work to a

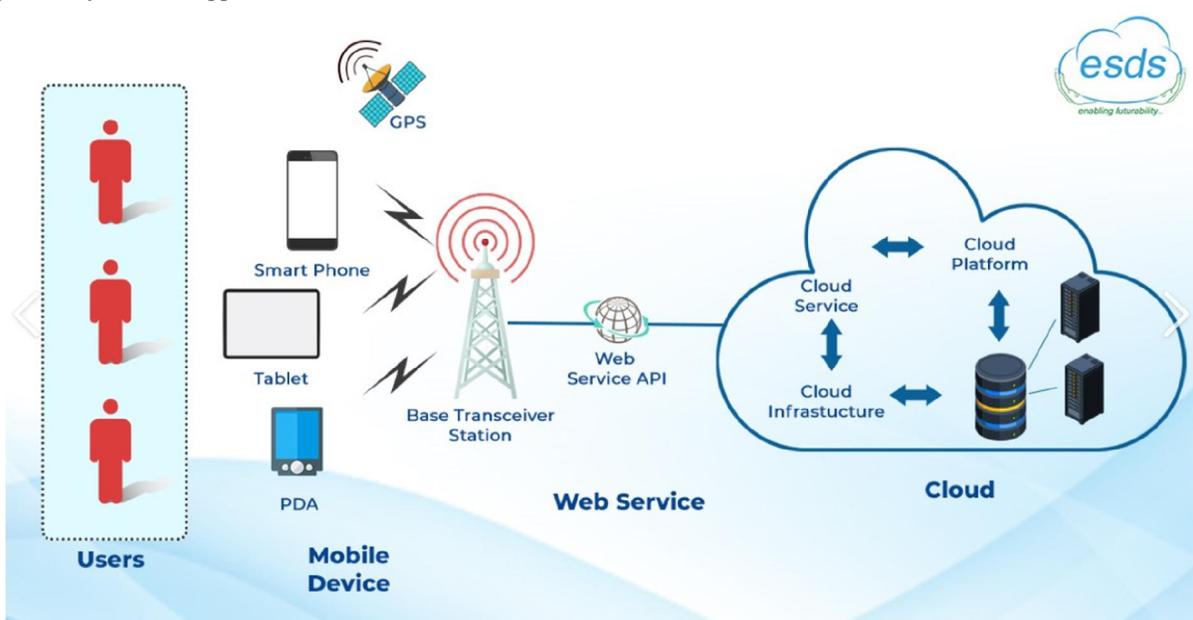


nearby cloud. In this mechanism, a stack is being maintained for the storage of execution state and only the recent execution state that is on top of the runtime stack will be migrated.



1.3 How Mobile Cloud Computing Works

On a remote data center, Mobile Cloud Applications are operated generally by a third-party, data is stored, and compute cycles are carried out. The uptime, integration, and security aspects are taken care of, by a backend, which also enables support to a multitude of access methods. These apps can function online quite well, however, they need timely updating. These need not be permanently stored on the device but they do not always occupy any storage space on a computer or communications device. Moreover, it offers the same experience as that of a desktop application, while offering the portability of a web application.

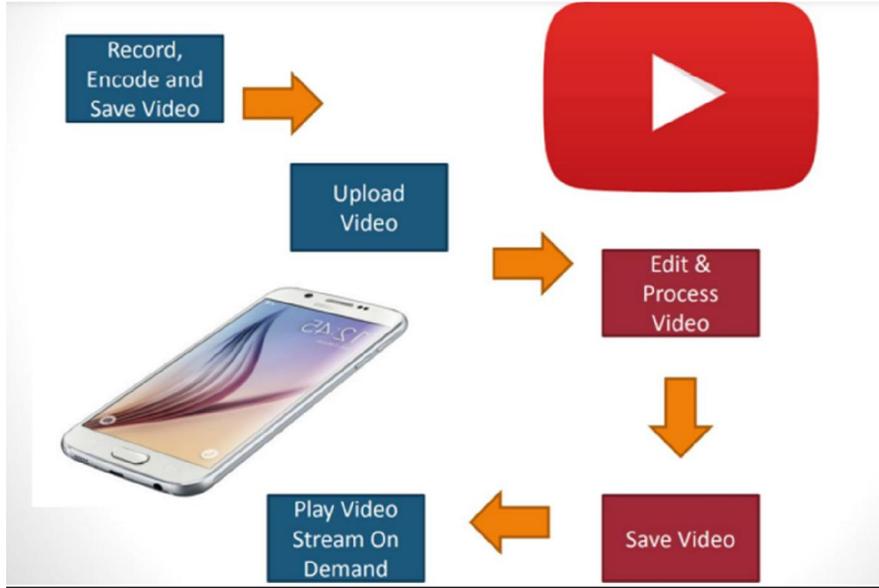


Mobile cloud computing uses cloud computing to deliver applications to mobile devices. These mobile apps can be deployed remotely using speed and flexibility and development tools. They can be delivered to many different devices with different operating systems, computing tasks, and data storage.

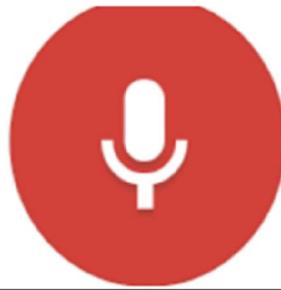
- Data processing and storage are moved from the mobile device to powerful and centralized computing platforms located in clouds.
- They are accessed by mobile devices over a wireless connection using an app or a web browser.



1.4 Videos in the Cloud



Google’s Voice Search



- When you talk to Android's voice recognition software, the spectrogram of what you've said is chopped up and uploaded to Google's cloud servers.
- It's then processed, using the neural network models.
- There are a couple of layers in processing speech. First Google tries to understand the consonants and the vowels. That is the foundational layer. Next, it uses those to make intelligent guesses about the words.

II. CONCLUSION OF MOBILE CLOUD COMPUTING

The goal of mobile cloud computing is to provide rich mobile computing through unified communication between front users (cloud mobile users) and end users (cloud providers) regardless of assorted, wireless environment and underlying platforms in global roaming. Despite some back draws, cloud computing and mobile cloud computing have a very bright future as they have made it very easy to access data and applications over the cloud without the need of incurring huge costs associated with the technology. Despite some back draws, cloud computing and mobile cloud computing have a very bright future as they have made it very easy to access data and applications over the cloud without the need of incurring huge costs associated with the technology. A survey related to MCC has been presented in this chapter and provides different trends and challenges. Evolution is happening as mobile usage is increasing on each passing day. Up to 35% revenues are coming from mobile devices and mobile applications (US Mobile Data Market Updates, 2010). Role of cloud computing is evident from the fact that large computation, time efficiency and many other factors are achieved through this technology. People want to use mobile for as many applications as possible. Some applications can only be executed using combination of mobile and cloud. This is the reason why this has become a hot topic in this area. This field has potential to



do business and services mobility with the help of cloud. More focus is to overcome limitations of mobile by using cloud servers for computation. As discussed above, different Mobile Cloud Computing models have been presented; one thing common in all is that they are lacking privacy of the application. Security needs to be ensured to make data protected from attack that comes outside from cloud. Mobile Cloud Computing privacy framework is used to take care of this issue. A virtual private network is created that handle activates and authentication framework. To make it more secure and reliable a standard framework is required to be created to handle data management as well. This chapter gives us ideas about new areas of research related to this field that are required to work upon

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