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Mobile Applications as Cloud Computing: A Study

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ABSTRACT: Cloud computing is most critical method for offering programs on cellular devices. In this paper, we introduce the concept of Mobile Cloud Computing (MCC), its internal workings and the various implementable architectures associated with the MCC. The market of cell recently has been evolving hastily and cloud computing is spreading into cell additionally. That is why mobile cloud computing is becoming a brand new and speedy developing problem these days. Cloud computing is the computing that gives virtualized IT sources as a provider via the use of the Internet era.

KEYWORDS: Mobile applications, Cloud Platform, Mobile Applications issues.

I. INTRODUCTION

Cloud computing gives a new idea of developing the mobile applications. Execution of any mobile application is not going to be dependent on handset with advance configuration any more. [1] Mobile application developers solve major challenges that are the existence of such a wide range of mobile operating systems. They are creating many versions of the same application. In any mobile device for any application execution two basic significant requirements are of processing power and memory of that device capable of supporting that corresponding application. Cloud Computing provides the opportunity to execute our applications on servers instead of running them locally and overcome the limitation of limited resources to a great extent. And also there will be no need for Mobile application developers to create many versions of same application. It's just the starting of a new phase of mobile application development there is still a long way to go to achieve a new mobile world infrastructure involving cloud computing in its base. [2].

Cloud computing is one of the most important technology which offers resource on demand facility. Cloud Computing is completely internet dependent technology. In this technology each client is assigned its own cloud with the help of different services like services of servers, storage, manage applications that can use by client [5]. Mobile cloud computing (MCC) brings new types of services and facilities for mobile users to take full advantages of cloud computing. The users require SaaS, PaaS or IaaS service which is provided through cloud. Mobile Cloud Computing at its simplest refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device [15]. MCC is a service that concedes resource constrained mobile users to adaptively adjust processing and storage capabilities by transparently partitioning and offloading the computationally intensive and storage demanding jobs on traditional cloud resources by arranging pervasive wireless access. [8] Mobile cloud applications measure the computing power and data storage away from mobile phones. [15]

II. RELATED WORK

Markus Schüring in 2011 gives an advent into cloud computing and its exceptional service fashions. Cloud computing services can be used by smart phones and other resource-starved devices. The three exceptional carrier levels had been analyzed with reference to cell usage, where IaaS with its hardware oriented method simplest seems to be appropriate for garage provisioning. The two other service levels, specifically PaaS and SaaS seem to be of greater hobby, as they offer the possibility to run complete applications or components of them inside the cloud. Author protected one of a kind communication network architectures that can be utilized in order to guide cloud computing services on smart phones and other resource-starved devices. Srinivas in 2012 describes the basic creation of cloud computing. The



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strategies of cloud those strategies set up in cloud computing. From a provider of customer point of view, there are essential usability, balance, and reliability troubles to solve.

Pragya gupta in September 2012 defined the Mobile Cloud Computing, as a development and extension of Cloud Computing and Mobile Computing, is the most rising and well familiar era with fast growth. The aggregate of cloud computing, wireless communication infrastructure, transportable computing devices, region-based totally services, mobile Web etc has laid the muse for the radical computing version. In this paper given an outline of Mobile Cloud Computing that consists of structure, benefits, key demanding situations, present research and open issues. Author define the offerings of cloud computing and define their makes use of in mobile cloud computing.

Sehoon Park in 2013 gives a quite efficient manner of growing the performance of mobile devices within the offloading structure. The integrated proxy device detects heavy computational function codes from the out bound web servers via programmer annotations. Our offloading method Reduces the response time of Java Script based internet applications and minimizes CPU usage of mobile devices. This technique is even extra useful for low-cost devices. It eliminates the hardware performance boundaries of low-cost devices, since the heavy loaded computational programs on the customer aspect could be offloaded to the server aspect. The experimental end results suggest a massive overall performance benefit. The framework decreased the reaction time the turn-primarily based gaming software. It provided an early consistent overall performance, regardless of the network bandwidth surroundings.

Amit K. Sharma in 2013 primary reason of Mobile Cloud Computing is supplying PC-based offerings to mobile Terminals. However, as the existing unique features between cell devices and PCs, we cannot immediately transplant the offerings from PCs' platform to mobile devices. Milos Stojmenovic in 2013 Author describe the biometric programs and outline the way to use these software in mobile cloud and the cloud can come together users. The biometric programs enhance these security problems in mobile. Lakshmi Neelima in 2014 investigates the concepts of Mobile Cloud Computing (MCC), difficult protection troubles and breaches, diverse subsisting safety frameworks and conclusively a few answers that growth the safety inside the Mobile Cloud Environment. Most of the frameworks ignored these security of make use of data privateness, statistics garage and power maintaining data sharing. Data privateness and mobile utility that makes use of cloud are the most challenging component.

Manmohan Chaturvedi gives evaluate the mobile cloud computing. The fallout of the proposed research is predicted to be of interest to both E-governance and E-commerce applications. The challenges in this evolving discipline of many studies. First segment attempting to symbolize the trouble in formal phrases and propose a lightweight mobile interface having confined dynamic functionality. Abdullah Gani finish that there are three fundamental optimization processes in MCC, which might be specializing in the restrictions of mobile devices, quality of communication, and department of packages services.

With the excessive growing of facts computation in trade and technology, the capacity of statistics processing has been taken into consideration as a strategic resource in many countries. Mobile cloud computing (MCC) as a development and extension of mobile computing (MC) and cloud computing (CC) has inherited the high mobility and scalability. Hoang T. Dinh propose that Mobile cloud computing is one among mobile era traits inside the destiny because it combines the blessings of each mobile computing and cloud computing, thereby imparting most advantageous offerings for mobile customers. Author describes the programs supported via cellular cloud computing including mobile trade, mobile gaining knowledge of, and cell healthcare had been mentioned which clearly show the applicability of the mobile cloud computing to an extensive variety of mobile services. Then, the troubles and related strategies for mobile cloud computing have been discussed.



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III. MOBILE CLOUD COMPUTING FUNCTIONING

It supports various synchronization modes such as both way sync, one way server sync, one way device sync, slow sync, and boot sync.

a) Push

Push service is the service that manages state updates being sent as notifications from the Cloud Server. This improves the mobile user's experience as they do not have to pro-actively check for the new information. When relevant the OfflineApp service provided is designed to be an App Developer's best friend. It carries the management capabilities to create smart coordination between the low-level services like Sync and Push. Because of the OfflineApp service, the programmer never has to write any code to actually perform any synchronization.

Synchronization is something that is managed by the OfflineApp service and it decides which mode of synchronization is the best for the current runtime state of App. The App developer is never exposed to low level synchronization details like both way sync, one way device sync, etc. It coordinates managing the Push service. It carries the smartness to track the type of data being pushed along with which it is installed App on the device needs the notification. The App developer does not have to write any special code to receive the notifications.

The moment the data channel for the App is established, all synchronizations and push notifications are automatically handled by OfflineApp service.

b) Mobile RPC

Mobile RPC facilitates making synchronous RPC (Remote Procedure Call) invocations from the device to server side 'MobileServiceBean' components.

c) Network

Network service manages establishing a network connection with the Cloud Server. It manages the communication channel needed to receive Push notifications from server. It carries smartness to track coverage and establishes proper connections automatically.

This is a very low-level service and an App developer never has to deal with using directly. The App developer is shielded from many low level connection establishment, security, protocol details, etc by using higher level Mobile Data Framework components.

d) Database

Database service manages local data storage details for the Apps. Depending on the platform in question it uses corresponding storage facilities. It is designed to coordinate storage among the suite of the Apps/Moblets installed on the device. It provides thread safe concurrent access to all Apps. Just like the Network service, it's a low-level service used by Mobile Data Framework components.

e) Inter-App Bus

Inter-App Bus service provides low-level coordination/communication between the suite of Apps/Moblets installed on device.

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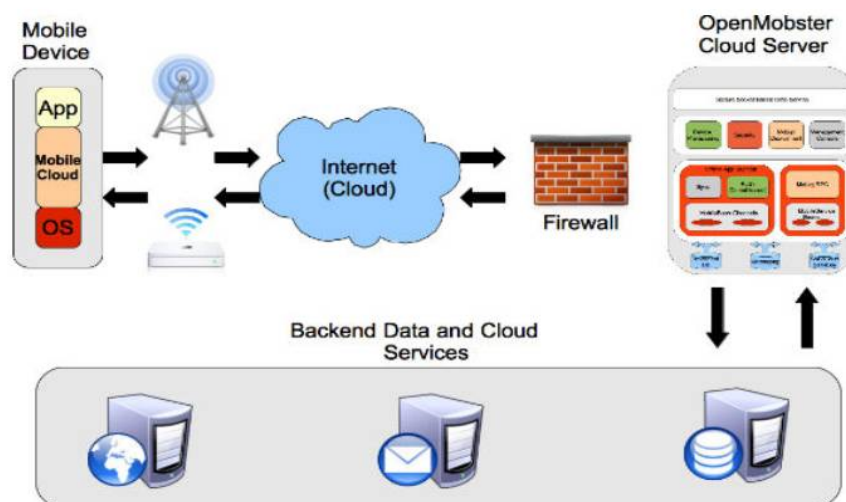


Figure 1: Architecture for Mobile Applications in Cloud Environment

In the field of MCC there are various challenges like handover delay, bandwidth limitation, task division for offloading, reliability, integrity of data delivered, and scalability. These issues of MCC without degradation in performance or change in infrastructure, security of data in mobile device within a cloud and in the communication channel, identity privacy, location privacy, etc. These issues are the biggest interferences in growth of mobile cloud computing [7]. In the mobile world using cloud computing concept is all about supplying mobile applications and services in the cloud. These applications approve through cloud service providers and then deliver it to end-users mobile handsets over the Internet when required. So in making remote applications available to mobile devices by the use of cloud computing. In MCC some extents of challenges are occur which are discussed here.

IV. CHALLENGES

A. LIMITED ENERGY SOURCE OF MOBILE DEVICE

In the mobile devices power capacity 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. If display element is taken under consideration then we can divide mobile application into two major categories, one is display applications and second is non-display application. For immersive applications, execution offload flexibility is even more constrained, as application functions running on server and device are tightly coupled. [10]

B. LOW BANDWIDTH

Many research scholars have introduced the optimal and efficient way of bandwidth allocation or the bandwidth limitation is still a big concern because the number of mobile and cloud users is dramatically increasing. In case of rich internet and immersive mobile applications, e.g. online gaming, that require high-processing capacity and minimum network latency cloud computing faces challenges due to low bandwidth of mobile network. So an improved network bandwidth is required so that data transfer within the cloud and other devices can be improved.

C. DATA DELIVERY

The feature of resource constrained, mobile devices such as PDAs in terms of memory, processing power, battery lifetime and screen size are vital point of concern. Data security is concerned organizations are needed to incorporate information assurance and operational security policies and procedures. Organization-wide training, education, and awareness package focusing on their issues can also be included to ensure that the policies and procedures are followed completely. Policies regarding access control, authentication procedures, account and user



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management, encryption, content assurance, and general communications security should be developed and compliance measures should be taken for enforcing them. It is very important to establish and maintain consumers' trust on to the mobile platform protection for providing user privacy and data/application secrecy from adversary. [11]

D. HIGH COMPUTING APPLICATION

Some applications may require massive processing power and storage, which cannot be deployed in mobile devices due to limited resources. Under such circumstances, we have to divide applications in such a way so that the complex part is done by a cloud and a simpler task is left to mobile device. [4]

V. CONCLUSION

The idea of cloud computing gives a modern-day opportunity for the development of mobile programs because it permits the mobile devices to preserve a completely thin layer for user packages and shift the computation and processing overhead to the digital environment. A cloud utility needs a constant connection that could show to be an Achilles heel for the cloud computing movement. However, as mobile internet talents continue to get better, it's likely that solutions to this particular problem will come to be apparent.

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BIOGRAPHY



Dr. G. Shankar Lingam completed his MCA in Chaitanya Degree & P.G College and M.Tech in CSE from Ramappa Engineering College respectively. He is having teaching experience of more than 20 years in various Under Graduate and Post Graduate courses. He has guided lots of students in various Under Graduate and Post Graduate Research Projects. At Present, he is working Professor, Dept. of CSE, Chaitanya Institute of Technology & Science, Warangal, Telangana, India.

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