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Development of Android Mobile Application for Cloud Video Streaming using Mobile Cloud Computing

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***Abstract*— The use of multimedia mobile phones is increased rapidly and also the size of worldwide mobile video market is increased but some mobile devices have low hardware resources such as RAM, processor etc. such mobile devices can't fulfil high resource requirements of multimedia applications. Mobile cloud computing can help to fulfil these requirements of multimedia application by providing storage & processing facilities on the cloud. In this model cloud is used for storage and management of video content across mobile devices.**

Mobile Cloud Computing (MCC) integrates cloud computing into the mobile environment and overcomes obstacles related to environment (e.g. availability, scalability, heterogeneity) performance (e.g. storage, battery life and bandwidth) and security (e.g. privacy and reliability).

First part of our model consists of android client which is installed on android device. Second part of model is cloud server which is used for storage of multimedia content. In this model video data is considered as multimedia content. Streaming technique is used for playing the video in media player. Streaming describes the act of playing media on one device when the media is saved on another.

Keywords*— Cloud computing, Multimedia, Streaming, Mobile Devices, Data storage.

I. INTRODUCTION

Now a day's use of mobile devices is increased very fast and becomes indivisible part of our life. The use of smartphones and other mobile device for sharing mobile multimedia also increased on social-networking sites like Facebook or streaming on website like YouTube. High quality mobile multimedia application demand intensive computing resources, like, more memory, high speed processors and higher storage resources. This problem has been addressed through cloud computing by development of mobile cloud application. Utilizing the computing and storage resources available in the cloud computing.

Use of mobile cloud computing will provide access more powerful application, and hence more significant growth. Mobile cloud computing refers to an infrastructure where both the data storage and the data processing happen outside of the mobile devices Mobile cloud application move the computing power and data storage away from mobile user. The mobile devices do not need a powerful configuration (e.g. speed and memory capacity) because all the complicated computing can be processed in the cloud. The user can store and process their video application data in the cloud in a distributed manner and saving the battery of mobile phones. This service provided capability of storing video in the cloud, and accessing that video from any mobile device anywhere.

II. LITERATURE SURVEY

[1] Multimedia on phones is a rapidly growing segment, and almost every mobile user would have a perceived need for a multimedia-based entertainment application. The size of the worldwide mobile video market was comprised of 429 million mobile video users in 2011, projected to grow exponentially to 2.4 billion users by 2016.However, in spite of advances in the capabilities of mobile devices, a gap will continue to exist, and may even widen, with the requirements of rich multimedia applications. Mobile cloud computing can help bridge this gap, providing mobile applications the capabilities of cloud servers and storage together with the benefits of mobile devices and mobile connectivity. Proposed model demonstrates the applicability of emerging cloud computing concepts for mobile multimedia. This model uses cloud for storage and content management of multimedia content (e.g. video data) across various devices like desktop and mobile devices.

[2] With worldwide shipments of smartphones (487.7million) exceeding PCs (414.6 million including tablets) in 2011, and in the US alone, more users predicted to access the Internet from mobile devices than from PCs by 2015 , clearly there is a desire to be able to use mobile devices and networks like PCs and wired networks today. However, in spite of advances in the capabilities of mobile devices, a gap will continue to exist, and may even widen, with the requirements of rich multimedia applications. Mobile cloud computing can help bridge this gap, providing mobile applications the capabilities of cloud servers and storage together with the benefits of mobile devices and mobile connectivity, possibly enabling a new generation of truly ubiquitous multimedia applications on mobile Devices: Cloud Mobile Media (CMM) applications.

In this paper, there are early trends and opportunities and benefits for new CMM applications and services. Analysing the challenges are imposed by mobile cloud computing that need to be addressed to make CMM applications viable, including response time, user experience, cloud computing cost, mobile network bandwidth, and scalability to large number of CMM users,

besides other important cloud computing issues like energy consumption, privacy, and security. This model illustrate the challenges using CMM, an approach that enables rich multimedia application on mobile devices, where compute intensive tasks like video processing is executing on cloud servers in response to mobile application on a mobile device and the resulting video has to be streamed back to the mobile device in near real time, making it the most challenging of the CMM applications. Subsequently, we focus in this paper on developing adaptive mobile cloud computing techniques to address the CMM challenges.

[3] Mobile Cloud Computing (MCC) has revolutionized the way in which mobile subscribers across the globe leverage services on the go. The mobile devices have evolved from mere devices that enabled voice calls only a few years back to smart devices that enable the user to access value added services anytime, anywhere. MCC integrates cloud computing into the mobile environment and overcomes obstacles related to performance (e.g. battery life, storage, and bandwidth), environment (e.g. heterogeneity, scalability, availability) and security (e.g. reliability and privacy).

[4] Currently, mobile application and computing is gaining a high momentum and playing a significant role in enhancing the internet computing infrastructure. In addition, the mobile devices and their applications have high technique in the service ever had, and developed rapidly. Mobile cloud computing is expected to generate significantly more innovative with multi applications. Mobile computing involves mobile communication, mobile hardware and mobile software, and currently there are many mobile cloud applications such as web browsing, email access, video playback, Cisco's web EX on the iPad, document editing, image editing, Google's Map, Gmail for iPhone, etc. These applications are using the software as a service model. In this article, a case of the art mobile cloud computing and its implementation ways are presented. Some of the challenging issues as well as future research directions will also be discussed.

[5] Multimedia on phones is a rapidly growing segment, and almost every mobile user would have a perceived need for a multimedia-based entertainment application. The size of the worldwide mobile video market was comprised of 429 million mobile video users in 2011, projected to grow exponentially to 2.4 billion users by 2016. Smartphones and tablet sales will contribute 440 million new mobile video users during the forecast period. However, in spite of advances in the capabilities of mobile devices, a gap between mobiles and pcs will continue to exist, and may even widen, with the requirements of rich multimedia applications. Mobile cloud computing can help bridge this gap, providing mobile applications the capabilities of cloud servers and storage together with the benefits of mobile devices and mobile connectivity. Proposed model demonstrates the applicability of emerging cloud computing concepts for mobile multimedia. This model will use cloud for storage and content management of multimedia content (e.g. video data) across various devices like desktop and mobile devices. This ensures high availability and integrity of data, along with content security and user privacy.

[6] Currently, mobile application and computing is gaining a high momentum and playing a significant role in enhancing the internet computing infrastructure. In addition, the mobile devices and their applications have high technique in the service ever had, and developed rapidly. Mobile cloud computing is expected to generate significantly more innovative with multi applications. Mobile computing involves mobile communication, mobile hardware and mobile software, and currently there are many mobile cloud applications such as web browsing, email access, video playback, Cisco's web EX on the iPad, document editing, image editing, Google's Map, Gmail for iPhone, etc. These applications are using the software as a service model. In this article, a case of the art mobile cloud computing and its implementation ways are presented. Some of the challenging issues as well as future research directions will also be discussed.

III. PROPOSED SYSTEM

Due to the increasing need of resources on mobile devices for multimedia applications as discussed in previous sections, we have proposed a model which uses cloud resources for mobile multimedia application. First part of our model consists of android client which is installed on android device. Second part of model consists of cloud server which is used for storage of multimedia content. In this model we are considering video data only as multimedia content. User has to sign up into android application using username and password.

After user authentication user have two options: Upload Video and Play Video. In upload video, user can browse video from his mobile and upload video. In play video user view list of available videos. If user clicks on one of the videos in the list he will be able to directly play selected video. In this model streaming technique is used for playing the video in media player. "Streaming" describes the act of playing media on one device when the media is saved on another. As this technique does not require actual video to be stored on mobile device for playing, in the proposed model it is not required that the video being played should be stored on mobile device.

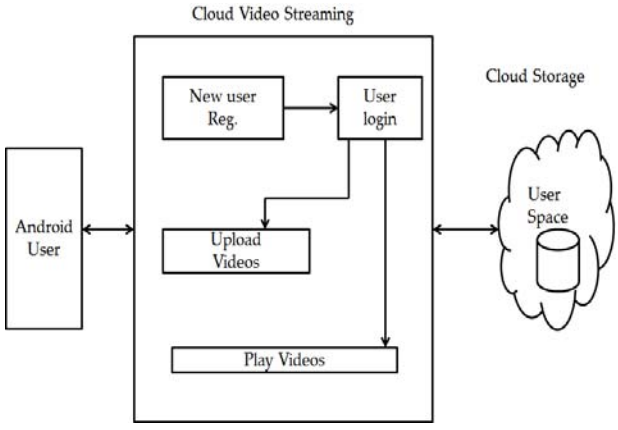

Fig. 1 System Architecture

IV. METHODOLOGY

There are three main modules …..

A. Android application
B. Cloud Server
C. Cloud Database Storage

A. Android Application

This Module consists of android client which will be installed of android application. User has to sign up into android application using username and password after user and device authenticated user can view list of available videos if user clicks on one of the videos in list he will be redirected to next screen consisting of media player where user will be able to play selected video. In this model streaming technique is used for playing the video in media player. 'Streaming' describes the act of playing media on one device when the media is saved on another. As this technique does not require actual video to be stored on mobile device for playing, in the proposed model it is not required that the video being played should be stored on mobile device.

B. Cloud Server

We have used the operating system Ubuntu 10.04 as cloud server which acts as a Cloud Controller. This cloud server gives response to the client request and also manages the cloud database server. We are building a private cloud. Private clouds describe offering that deploy cloud computing on private networks. It consists of applications or virtual machines in a company's own set of hosts. They provide the benefits of utility computing shared hardware costs, the ability to recover from failure, and the ability to scale up or down depending upon demand. Although the client thinks of the cloud as a single entity, the implementation typically require one or more data centers, composed of potentially huge numbers of service instances running on a large amount of hardware. Inexpensive commodity PCs structured into clusters are popular. A typical data center has an outward facing bank of servers with which client systems interact directly. Cloud systems implement a variety of DNS and load balancing/ routing mechanisms to control the routing of client requests to actual servers.

C Cloud Database Storage

This module consists of cloud database which is used for storage of multimedia content and user registration information. In this module we are considering only for video data as multimedia content. We have used MySQL server as a database because it is open source code. If we want to upload video then we can choose any video from mobile and click on upload button. Then the reference of the video is stored in the database and video is stored in user space. If we want to play video, click the button 'play video' then we can see list of videos in database. The user registration and login details are stored in database server.

V. EXPERIMENTAL RESULTS

Fig. 2 Sign In

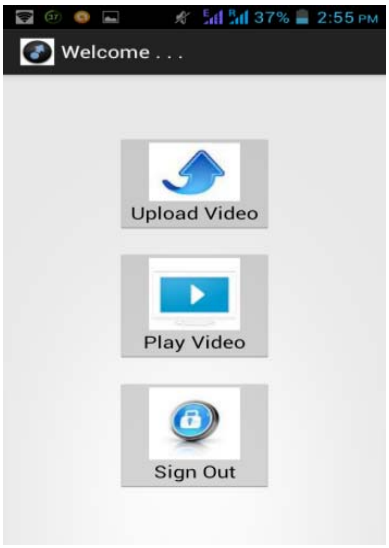

Fig. 3 Main Menu

Fig. 4 Play Video

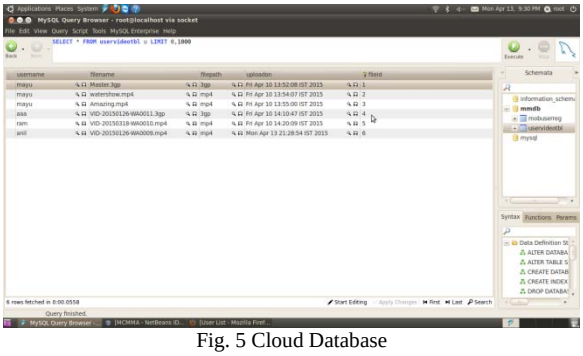

Fig. 5 Cloud Database

VI. CONCLUSIONS

Mobile multimedia applications have high resource requirements on mobile devices, whereas only some of the devices are able to fulfil those requirements. Mobile cloud computing can help reduce this gap between requirements and availability of resources. After analysing the application result we can say that mobile application using cloud resources is more efficient in terms of response time as well as memory requirements.

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