



ISSN 2047-3338

Mobile Multimedia Storage: A Mobile Cloud Computing Application and Analysis

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Abstract– During the last few years, there is a revolutionary development in the field of mobile computing, multimedia communication and wireless technology. In this paper, we present study and comparative analyses of different technologies used for mobile multimedia storage and address different issues regarding its architecture and design; especially in cloud computing environment and suggest some solution for its improvements.

Index Terms– Application, Analysis, Cloud Computing, Storage and Multimedia

I. INTRODUCTION

MOST of us utilize our mobile phones as mini-computers that travel and being with us and retain us connected 24/7, and that number will assuredly endure to grow up to the peak. Mobiles are now essential part this modern age business world and significance of mobile database is inevitable/unavoidable. According/conferring to a new/novel study from ABI Research has exposed that cloud computing will entirely renovate future of mobile applications development/progression, and their utilization.

Cloud computing will vividly diminish the obligation/requirement of advanced/modern handsets for running mobile applications, according/conferring to the study. Conferring to the up-to-date study from Juniper Research, the market for cloud-based mobile applications will breed 88% from 2009 to 2014. The market was just over \$400 million this past year, says Juniper, but by 2014 it will touch \$9.5 billion [8]. A mobile database system (MDS) delivers full database and mobile communication functionality.

It permits a mobile customer to pledge/inaugurate transactions from anyplace and anytime ad promises their /uniformity conserving execution. Multimedia libraries have gigantic volume of information for communication in text, audio, graphics, video, animation form. With marvelous

encroachment/progression in technology people expecting/guessing more and they want/need services anywhere and anytime. Even though present technology and advancement/progression consents connecting on move, yet there are definite issues/matters that thwart the communication process.

A. Mobile Multimedia Challenges

As we know that multimedia data is consists of texts, graphics, audio, video it needs hefty amount/sum of storage and reckless promptness/speed for transferring/transmitting data. For storing/packing and managing/handling data in heterogeneous/dissimilar mobile environment certain issues/matters are there that need/requires to be concern or tackle with and can be measured as issues/matters of mobile multimedia database (MMMDB) issues are:

- How to exemplify database object proficiently
- Database architecture and model
- Efficient multimedia data retrieval

The other issues/matters interrelated to providing multimedia content to mobile devices are frequent/regular device disconnection as in mobile environment connection breaks/halts frequently that leads/directs to the issue/matter of synchronization/harmonization and consistency. Mobility issues/matters are needed to be considered for future.

There are mainly two types of mobility a) Terminal Mobility and, b) network Mobility. Even though promptness/speed of Internet upgraded a lot in recent/current year with improvement of technology, but still there is requisite of enhancement. Other issues/matters are poor/meager performance, restriction/limitation of communication bandwidth, limitation of the database model, data consistency, synchronization, limited device storage and other resource constraints. An issue of sanctuary/safety and confidentiality is also imperative as data in mobile environment is broadcast; this might leads/directs to the issues/matters of security/safety and confidentiality of data.

II. FUTURE OF MMMDB: MOBILE CLOUD COMPUTING (MCC)

Cloud computing is the following gigantic thing in the present market scenario. Cloud computing is not only connected to personal computers, but it also affects/shakes and cripplingly sway/impact the mobile technology. In Mobile Cloud Computing both the data storage and the data processing ensue/happen outside of the mobile device i.e. when we combined concept of cloud computing in mobile environment. In MCC scenario all the computing power and data storage exchange into the mobile cloud. MCC will not offer doles/benefits only to the smart phone consumers but for will support a wider range of mobile subscriber/user. With MCC mobile phone consumer will get/acquire benefit in number of ways and help/assist them to ran there business application without large/hefty amount of capital investment in infrastructure and services.

A. MCC: Services and Modes of Cloud Computing Considerations

In cloud computing there are different /diverse classifications of cloud services. These services supplied to the users/customers in real time through internet.

1) *Software as a Service (SaaS)*: In this model an application is hosted as a service to customer/user that entrees/accesses it through the Internet [7]. For example web user/client can utilize Google doc and they do not need/require installing any application for that. Other providers like Amazon offers cloud services and subscriber need/require to pay only for the amount of services they want to use/utilize.

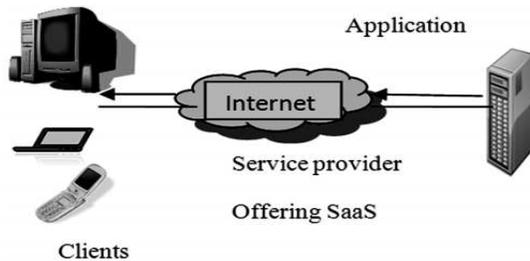


Fig. 1: Software as a Service (SaaS)

2) *Platform as a Service (PaaS)*: PaaS services include/take in application design, development, testing, deployment and hosting [7]. In this not only services (application software etc) but server, memory and other

platforms can be used/utilized and subscriber needs/requires to pay as per terms and conditions.

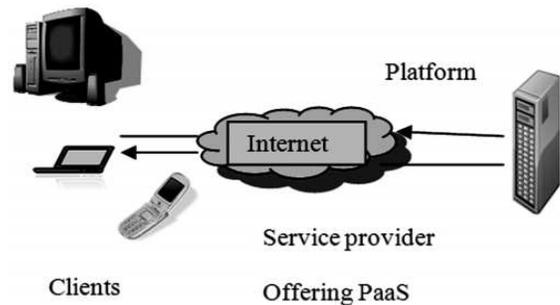


Fig. 2: Platform as a Service (PaaS)

III. MMMDB CONTENTS TYPE CONSIDERATION MCC ENVIRONMENT

Usually MMMDB contents are either Interactive or Non-interactive. The Interactive multimedia also known as non linear multimedia and non interactive multimedia known as linear multimedia. In interactive multimedia end user/customer act together/interact with the content with some applicable user interface. All e-learning materials are example of interactive multimedia. Thus in interactive multimedia processing consumption of power is much high as compare to non interactive multimedia. In non interactive multimedia customer has no control on information flow i.e., it runs without any human intervention. The following Fig. 3 illustrates the MMMDB Interactive and non interactive contents retrieval and delivery with the mobile cloud computing. Non-interactive contents can be cured as a non interactive mobile TV contents. Of course a mobile device needs a receiver like a mobile TV to receive broadcasted Non-interactive multimedia contents [3].

IV. MOBILE CLOUD COMPUTING: FUTURE SCOPE AND CHALLENGES

In near future because of MCC there will be no necessity of downloading and installing applications on the mobile handsets (smart phones, tablets, etc.) users/customers will be able to entree them unswervingly/directly in the cloud and display/exhibit through the mobile browser, it is analogous to Software-as-a-Service provisioning. Other extrapolations embraces according/conferring to Gartner's 2010 key IT

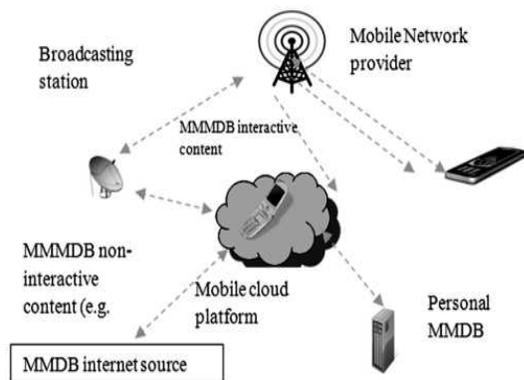


Fig. 3: Mobile Cloud

predictions for organizations, in nearby future mobile phones anticipated to surpass PCs as the most common Web access device worldwide by 2013. ABI Research foretells that there will be nearly one billion end customers accessing the mobile cloud by 2014. Smart phone applications will switch from the handset itself to the cloud creating an ecosystem for new/novel kind/sort of smart phones-sometime termed "Mobile Cloud Phones" [8]. Although future of MCC is packed/full of opportunities, but it has certain challenges as:

A. Environment Challenges

The spaces in which mobile client and server that want to communicate are also an issue to be considered. This affects many other factors like delays and connectivity issues.

1) *One Dimensional Metric Space*: Mobile Target Server or Mobile Target Client on the road network can be considered as One Dimensional metric space. Here transit-time delay is to be considered as the major obstacle in delivering MMDDB contents. For example, on festive seasons, the mobile network will have relatively heavy traffic which will affect the transit-time. Similarly, another issue which can be considered in relation to transit-time delay is frequent access of current hot talks for certain periods of time. (Michael Jackson's ring tone, wall paper, MP3 and streaming videos). These sudden unexpected frequent accesses will affect the MMDDB's performance, scalability, integrity and availability [5].

2) *Two Dimensional Metric Space*: Mobile Target Server or Mobile Target Client on the plane like manner representation used in GIS can be considered as Two Dimensional metric space [5].

3) *Three Dimensional Metric Space*: System involving control of aircraft or submarine can be considered as Three Dimensional metric space" [5].

4) *Four Dimensional Metric Space*: System which concern themselves in the possibility of intersecting vehicles trajectories (usually trying to avoid collisions) may need to operate in four dimensions (3 spatial dimension and 1 temporal) can be considered as four dimensional metric space" [5]. Systems involving tracing device movements in incessant areas (at sea, in the air, fast moving wild fires, forest fires, strong wind, etc) in which, both devices and environment are mobile [5]. To represent this settings temporal dimension can be used.

5) *Green Cloud*: The core/main principle/standard of the green Cloud is to carry new/novel business prospects to Telco and in the equal time be as economically/energy efficient as possible [2]. Concept of green cloud is to execute all cloud computing function in an energy efficient environment. Although many architecture are suggested for this but still it requires/needs enhancement.

V. CONCLUSION

In this day to day changing technology environment, demands of the users also changes. Users demands quality service at anytime and anywhere with speed and accuracy. In this paper author discussed various issues including current problems and the problems that may arise in future. Author has discussed challenges that may encounter in implementation of MMDDB.

REFERENCES

- [1] Ismail Khalil Ibrahim, Handbook of Research on Mobile Multimedia, 2nd Ed.
- [2] Martin Gilje Jaatun, "Cloud Computing: First International Conference", CloudCom 2009, Beijing, China, December 1-4, 2009, Proceedings, Springer Publications.
- [3] Selvakumar Samuel, Kesava Pillai Rajadorai, "Mobile Multimedia Database Common Issues and Future Considerations", in Proceeding of MoMM 2009 IEEE.
- [4] J. Arreymbi, and M. Dastbaz, "Issues in Delivering Multimedia Content to Mobile Devices", in Proceedings of the Sixth International Conference on Information Visualisation, (IV'02) 1093-9547/02 \$17.00 © 2002 IEEE.
- [5] Le Gruenwald, Frank Olken, "Mobile Database Research: What Is To Be Done?" DOI=web.mst.edu/~cswebdb/Workshop-AFRL/Paper3209559.pdf
- [6] Özsu, M.T. 1999. "Issues in Multimedia Database Management". In Proceedings of the 1999 International Symposium on Database Engineering and Applications (August 02-04, 1999). IDEAS IEEE Computer Society, Washington, DC, 452.

- [7] Toby Velte, Anthony Velte, Robert C. Elsenpeter, "Cloud Computing: A Practical Approach", Tata McGraw Hill Professional, 2009.
- [8] Research Report by ABI Research in 2009. www.abiresearch.com/1003385Mobile+Cloud+Computing.