MOBILE CLOUD AWARENESS CONCERNS ISSUES AND CHALLENGES

Ms. Rincy Merlin Mathew  
Department of Computer Science  
King Khalid University  
Abha, KSA  
mathew.rincymerlin@gmail.com

Ms. Shamim Kamal Abdul Nazar  
Department of Computer Science  
King Khalid University  
Abha, KSA  
shamimks02@gmail.com

Ms. Saima Haroon  
Department of Computer Science  
King Khalid University  
Abha, KSA  
saimaharoon1983@gmail.com

Abstract—Cloud computing is a new computing criterion which focuses on reliable, adaptive and Quality of Service (QoS) based computing environments for IT users. The efficient energy use of its data centers has become one of the major concerns in the cloud environment. The services of mobile cloud computing has reformed the way in which mobile subscribers across the globe influence has employed. The mobile device has evolved from a simple device in which the users can access all its services anywhere, anytime. Mobile Cloud Computing plays a vital role in their performance provides security by combining cloud computing into the mobile environment. Mobile features are accessed by users to enhance their availability of mobile cloud. Various kinds of applications such as mobile health, mobile learning, mobile commerce and mobile entertainment are exploiting Mobile Cloud Computing technologies. This paper makes a study on mobile computing architecture, need of mobile cloud computing, benefits of mobile cloud and security in mobile cloud. In addition, it also discusses about the emergence and challenges in the mobile cloud.

Keywords: Cloud Computing, Mobile Cloud Computing, Virtualization, Challenges in MCC, Advantages, Issues, Security

I. INTRODUCTION

Cloud Computing refers to the use of networked infrastructure software and it provides resources adequately to users in this over-changing and challenging environment. Mobile cloud computing is a form of cloud computing in combination with mobile devices. Mobile devices are progressively becoming a crucial part of human life as the most efficient and suitable communication tool which is not circumscribed by time and place. In contrary to accustomed mobile computing technologies, the resources in mobile cloud computing are virtualized and entrained to a group of abundant distributed computers rather than local computers or servers. The data and processing could happen outside of the mobile devices, empowering new types of applications such as context-aware mobile social networks. Consequently, many mobile cloud applications are not constrained to powerful smartphones, but to an extensive range of less advanced mobile phones and hence, to a broader subscriber audience. Mobile devices cannot cope with intricate applications because of their distinctive characters. Also, it is impossible that a mobile device is always online. The omission of the principles, security and privacy, expandable mobile applications requirement may obscure the growth of Mobile Cloud Computing. Mobile Cloud Computing (MCC) is based on eliminating the limitations of mobile computing by compiling the concept of cloud computing and mobile Internet. Mobile users acquire an extravagant knowledge on discrete services from mobile applications, which run on the devices and on remote servers via wireless networks. Simultaneously, smartphones are treated as the typical ones for the various mobile devices as they have been connected to the Internet with a prompt emergence of wireless network technology. Ubiquity and mobility are two key features in the next generation network that fluctuates the personalized network services through numerous network terminals and modes of access.

There are several Smartphone operating systems available such as Google's Android, Apple's iOS, RIM BlackBerry, Symbian, and Windows Mobile Phone. Each of these platforms sustains third-party applications that are adopted in cloud. Currently, this cloud computing is not bound only to the personal computer, but it also has a profound impact on the mobile technology.

II. RELATED WORKS

Pooja N. concluded that mobile cloud computing provides a platform where mobile users make use of cloud services on mobile devices [1]. Dipayan Dev discussed about various challenges and measures to overcome certain loopholes. [2]. Mandeep Kaur Saggi suggested about the various features and infrastructure of mobile cloud computing [3]. Eweoya Ibukum made a study on privacy, security and trust in mobile cloud computing [4]. Dhammapal Tayade has introduced about mobile cloud computing applications and certain security issues [5]. Shrvanthi C. made a survey on cloud applications, existing challenges and its solutions and approaches to overcome the challenges [6]. Ahmed Dheyya Basha has introduced an art of mobile cloud computing and its implementation ways [7]. Niroshinie Fernando assessed about an overview of critical analysis of challenges and highlighted different approaches to tackle security issues [8]. Hossein Movafeh Ghadirli discussed about an intelligent learning system to reduce training costs and hardware dependency and increase consistency, efficiency and data reliability [9]. Paramvir Bahl investigated certain challenges occurred in mobile cloud and some of its solutions [10]. Pragya Gupta discussed about various

III. ARCHITECTURE OF MOBILE CLOUD COMPUTING

MCC is inclusive of four types of cloud resources:

- Distant mobile cloud
- Distant immobile cloud
- Proximate mobile computing entities
- Proximate immobile computing entities
- Hybrid

The following diagram depicts the framework for mobile cloud computing architecture:

Mobile Cloud computing has an access to cloud computing facilities in the mobile environment. It is a new model where the data processing and storage can be moved from mobile devices to powerful and centralized computing platforms located in clouds. These platforms can then be accessed through wireless connections via web browsers on the mobile devices. The client side has adapted this technique feasibly for mobile phones, where the concept is similar to cloud computing. The mobile devices are linked to the mobile networks through base station that establish and control the connections and functional interfaces between the networks and mobile devices. The request and information from mobile users are transmitted to the central processors that are connected to the servers providing mobile network services.

IV. NECESSITY FOR MOBILE CLOUD COMPUTING

The mobile cloud computing strengthens user’s information in terms of location, context, accessed high services, applications and network intelligence. For the last two decades, the number of mobile users in all domains has expanded enormously and so are all the smartphones. In the modern era of novel technology, the majority of mobile devices are much enhanced in memory capacity, speed of display, power of battery or network connectivity for various features, which allow the user to access via diverse applications and numerous services on the mobile cloud.

V. NEED OF SECURITY IN MOBILE CLOUD

One of the main issues in using mobile cloud computing is to secure the data of mobile user stored in mobile cloud. Any unauthorized person who tries to manipulate the data is harmed. Hence the main concern of cloud service provider is to provide the security of data created and manipulated on a mobile device or cloud server. Mobile applications must also be secured because better services are provided to mobile users by using cloud resources. Cloud Server stores the data of the user and once it is stored, the user does not have that data on his own device. Thus, it leads to risks such as data privacy and confidentiality of the data. Integrity of data plays a crucial role in storing data of the user. Unauthorized person performing changes in data of other person can ruin the integrity of data. Therefore, data confidentiality is also an apprehension of the user’s data. Authentication of user is also a prominent concern to verify if the originator is a valid user.

VI. EMERGENCE IN MOBILE CLOUD

Although having substantial enhancement in the field of mobile computing, however many issues are in existence:

- Emergency Efficient Transmission- There should be a monotonous delivery of information between cloud and the mobile devices.
- Architectural Issues- Mobile cloud computing is required to make architectural neutral because of heterogeneous environment.
- Live VM Migration- It transfers an application, which is resource-intensive to cloud and should be accomplished via Virtual Machine.
- Mobile Communication Congestion- The increase in the workload to empower efficient communication between cloud and mobile devices is as a result of the continuous increase in demand for mobile cloud services.
- Security and Privacy- It is one of the prominent topics since mobile users share their personal information over the cloud.

VII. CHALLENGES IN MOBILE CLOUD

The main objective of mobile cloud computing is to provide an effective method for users to access and receive data from the cloud. This helps in accessing cloud computing resources effectively by using mobile devices. The major challenge of mobile cloud computing arises from the combination of mobile devices and wireless networks, as well as their own restriction and limitation. In mobile cloud computing environment, the limitations of mobile devices, quality of wireless communication, types of application, and sustain cloud computing to mobile are all important factors that influence assessing from cloud computing.

Mobile devices are usually less powerful and use batteries, whose capacity is essentially restrictive. It is important to maximize battery life through the careful partitioning of application functions across servers and devices.

VIII. BENEFITS OF MOBILE CLOUD

- Reliability- Mobile devices allow users access to cloud services anywhere and anytime.
- Real Time data availability- Mobile cloud services can give information about a user’s location, context and requested services to improve user experience.