An Overview of Mobile Cloud Computing

Neethu Jose
Fifth Semester BCA
Carmel College Mala

Aishwarya Mohan
Fifth Semester BCA
Carmel College Mala

Abstract: **Mobile cloud computing (MCC) is the combination of cloud computing, mobile computing and wireless networks to bring rich computational resources to mobile users, network operators, as well as cloud computing providers. The ultimate goal of MCC is to enable execution of rich mobile applications on a plethora of mobile devices, with a rich user experience. MCC provides business opportunities for mobile network operators as well as cloud providers.**
More comprehensively, MCC can be defined as "a rich mobile computing technology that leverages unified elastic resources of varied clouds and network technologies toward unrestricted functionality, storage, and mobility to serve a multitude of mobile devices anywhere, anytime through the channel of Ethernet or internet regardless of heterogeneous environments and platforms based on the pay-as-you-use principle.

I. INTRODUCTION

Mobile devices (e.g., smartphone and tablet PC) are increasingly becoming an essential part of human life as the most effective and convenient communication tools not bounded by time and place. Mobile users accumulate rich experience of various services from mobile applications (e.g., iphone apps and Google apps), which run on the devices and/or on remote servers via wireless networks. The rapid progress of mobile computing (MC) becomes a powerful trend in the development of IT technology as well as commerce and industry fields. However the mobile devices are facing many challenges in their resources (e.g., battery life, storage, and bandwidth) and communications (e.g., mobility and security). The limited resources significantly impede the improvement of service qualities.
Cloud computing (CC) has been widely recognized as the next generation computing infrastructure. CC offers some advantages by allowing users to use infrastructure (e.g., servers, networks, and storages), platforms (e.g., middleware services and operating systems) provided by cloud providers (e.g., Google, Amazon).

Cloud computing is known to be a promising solution for MC because of many reasons (e.g., mobility, communication and portability).in the following we describe how the cloud can be used to overcome obstacles in MC, there by pointing out advantages of MCC. (Salesforce) at low cost .in addition, CC enables users to elastically utilize resource in an on _demand fashion. As a result, mobile applications can be rapidly provisioned and released with the minimal management efforts or service provider's interactions. With the explosion of mobile applications and the support of CC for a variety of services for mobile users ,mobile cloud computing(MCC)is introduced as an integration of CC into the mobile environment.MCC brings new type of services and facility's mobile users to take full advantages of CC.

II. ARCHITECTURES OF MOBILE CLOUD COMPUTING
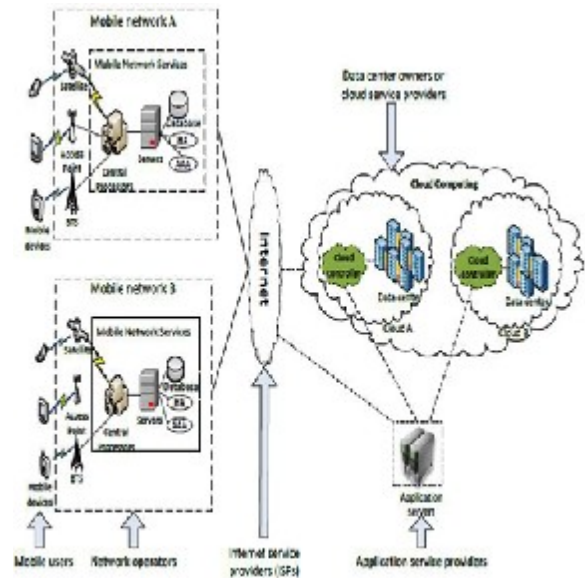
From the concept of MCC the general architecture of MCC, can be shone in figure 1.in figure 1, mobile devices are connected to the mobile network via base stations (e.g,base transceiver stations,access point or satellite)that establish and control the connections (air links)and functional Interfaces between the networks and mobile devices .mobile users' requests and information (e.g., ID and location) are transmitted to the central processors that are connected to servers providing mobile network services. Here, mobile network operators can provide services to mobile users as authentication and authorization and accounting based on the home agent and subscribers data stored in database. After that subscribers requests are delivered to a cloud through the internet .in the cloud, cloud controllers process the requests provide mobile users with the corresponding cloud services. These services are developed with the concepts of utility computing virtualization, and service oriented architecture (e.g., web, application, and database servers).

III ADVANTAGES OF MOBILE CLOUD COMPUTING

Cloud computing is known to be a promising solution for MC because of many reasons (e.g., mobility, communication, and portability [13]). In the following, we

describe how the cloud can be used to overcome obstacles in MC, there by pointing out advantages of MCC.

1. Extending battery life time.
2. Improving data storage capacity and processing power
3. Improving reliability
4. Dynamic provisioning. Dynamic on
5. -demand provisioning of resources on a fine-grained, self-service basis is a flexible way for service providers and mobile users to run their applications without advanced reservation of resource scalability. The deployment of mobile applications can be performed and scaled to meet the unpredictable user demands due to flexible resource provisioning. Service providers can easily added and expand an application and service without or with little constraint on the resource usage.
6. Multitendency.service providers (e.g., network operator and data center owner) can share the resource and cost to support a variety of applications and large number of users.
7. Ease of integration. Multiple services from different service providers can be integrated easily through the cloud and internet to meet the user demand.

IV. APPLICATIONS OF MOBILE CLOUD COMPUTING

A. Mobile commerce

Mobile commerce (m-commerce) is a business model for commerce using mobile devices. The commerce applications generally fulfill some tasks that require mobility (e.g., mobile transactions and payments, mobile messaging, and mobile ticketing).the m-commerce applications can be classified into few classes including finance, advertising, and shopping.

B. Mobile learning

Mobile learning (m-learning) is designed based on electronica learning (e-learning) and mobility. However, traditional m-learning applications have limitations in terms of high cost of devices and network, low network transmission rate, and limited educational resource

C. Mobile health care

The purpose of applying MCC in medical applications is to minimize the limitations of traditional medical treatment (e.g., small physical storage, security and privacy, and medical errors. Mobile health care (m-healthcare) provides mobile users with convenient helps to access resources (e.g., patient health records) easily and efficiently. Besides-health care offers hospital and health care organizations a variety of on-demand service on clouds rather than owning standalone applications on local servers.

D. Mobile gaming

Mobile game (m-game)is a potential market generating revenues for service providers'-game can completely offload game engine requiring large computing resource

(e.g,graphic rendering)to the server in the cloud ,and gamers only interact with the screen interface on their.
Devices.

V. ISSUES OF MOBILE CLOUD COMPUTING

A. Challenges Regarding Mobile Communication:
1) Low Bandwidth:
2) Resource poverty of Mobile devices
   B. Challenges Regarding Network
1) Inherent Challenges of Wireless Network:
Wireless network is base for carrying out cloud computing and it has its own intrinsic nature and constraints.
2) Various Network Access Schemes
3) Lack of Speedy Mobile Internet Access Everywhere
4) Seamless Connection Handover:
   C. Challenges Related to mobile Applications
1) Interoperability
2) Cloud Application Flexibility
3) Mobile Cloud Convergence

VI. CHALLENGES REGARDING SECURITY

1) Information Security
2) Privacy and Confidentiality
3) Malicious Attacks
4) Network Monitoring
5) Compliance and Enforcement
6) Incident Response

VII. CONCLUSION

Mobile Cloud Computing is one of mobile technology trends in the future since it combines the advantages of both mobile computing and cloud computing, thereby providing optimal services for mobile users. According to Gartner, corporate employees using smartphones and tables for business purposes represent about75% of the mobile cloud app market. The mobile cloud app market is expected to exceed $9 billion by 2014.with this importance, this paper has [provided an over view of mobile cloud computing   in which its definitions architecture, and advantages have been presented. Next applications models for implementing cloud computing in mobile devices are discussed. In the last section several issues regarding, MCC and steps which can be taken to overcome these issues are presented.

VIII. REFERENCES

[1] http://www.ijcsit.com/docs/volume%205/vol5issue05/ijcsit20140505137.pdf
[2] http://www.serc.org/journals/IJGDC/vol6_no6/4.pdf
[3] http://cloudtimes.org/2011/07/11/overcoming-challenges-in-mobile-cloud-computing/
[4] https://en.wikipedia.org/wiki/mobile_cloud_computing