Volume 4, Issue 4, April 2014 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

Cloud Computing for Mobile Application

Mandar K. Kekade, G.A.Patil
Computer Science & Engineering
Shivaji University India

Abstract— Cloud computing is an incipient concept combining many fields of computing. Cloud computing provides the services, reducing cost, increasing storage providing flexibility and mobility of information, software and processing capacity over the Internet. However, while achieving the actual realization of these benefits for mobile applications, many new research queries/questions has been opened up. We have surveyed existing work in mobile computing through the prism of cloud computing principle in order to understand how to facilitate the building of mobile cloud-based applications. Though their are many advantages of mobile cloud computing, but their is no open standard available for MCC which handicaps portability of MCC. In this paper we propose a system which overcomes all the challenges in MCC. 'Open cloud computing' means any user can access the cloud services provided by any cloud service providers(CSPs).

Keywords— mobile cloud computing(MCC), mobile agent, cloud computing service provider (CCSP).

I. INTRODUCTION

Cloud computing in mobile platforms has invoked a new wave of evolution in the rapidly developing mobile world. Although several striking research work has been conducted in the high computing counterparts of mobile technology, the field of cloud computing for mobile applications is vastly unexplored. Together with spontaneous growth in the cloud computing concept and mobile applications, mobile cloud computing (MCC) has been introduced to be a powerful technology for mobile services. MCC incorporate the mobile applications with the cloud computing and overcomes problems related to the storage, security and performance. The end mobile device user will have many advantages of the Mobile Cloud Computing. Without a high level of capital expenditure on hardware and software resources, company users can share resources and applications. Nature of cloud applications is advantageous for users since they do not need to have very technical hardware to run applications as these computing operations are run within the cloud. Mobile Cloud Computing also help to overcome limitations of mobile devices in particular of the processing power and data storage. But there is no standard available for cloud computing because of which portability and interoperability is impossible between different cloud service providers. A possible solution proposed here is, the conception of Open Cloud Computing where, it incorporates multiple CCSPs (Cloud Computing Service Provider) service to provide a uniform resource interface for the user.

II. MOBILE CLOUD COMPUTING

A. *Architecture for Mobile Applications in Cloud Enviornment:*

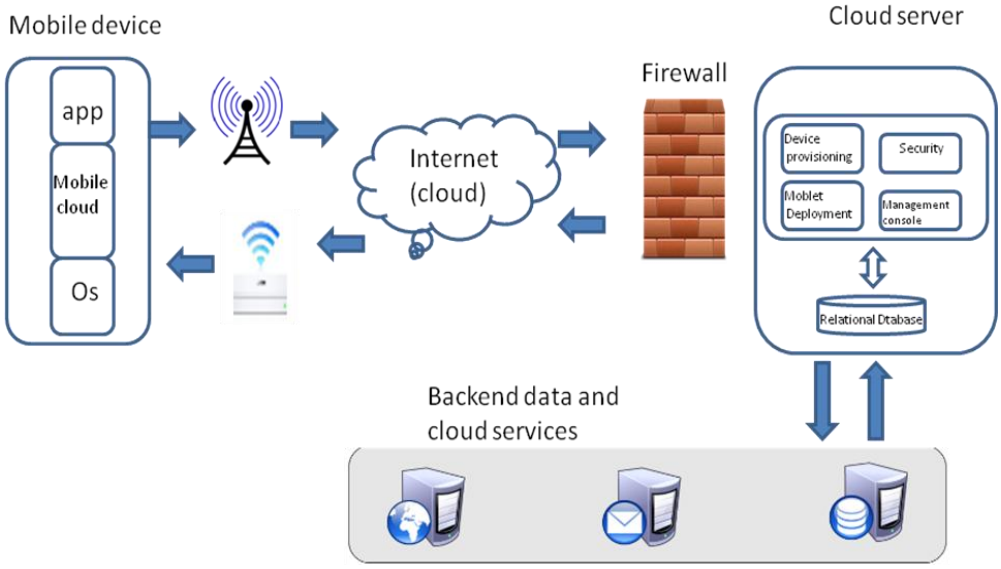

Fig. 1: Architecture of mobile cloud computing.

B. *Typical services needed by a mobile cloud computing:*

The most essential services include:

- Syn: This service synchronizes the updates made to mobile applications with cloud server and vice versa.
- Network : It is a low level service. It manages the communication channel to receive data from the server. It also establishes required connections automatically
- Database : This service manages the local data storages for mobile applications
- Security : To ensure that mobile devices connected to server has full access permission, security service provides authentication and authorization. Every device must be first registered with the server to access the services provided by that server

III. CHALLENGES IN MOBILE CLOUD COMPUTING

To deliver the good cloud services, following factors are essential:

- Application functions should be partitioned across server and devices.
- For more speed and faster data transfer, high network bandwidth is essential.
- To optimize network and device costs, adaptive monitoring of network is required.
- Faster responses with low network latency.

A . Absence of Standards:

Though cloud computing is considered to have many advantages such as lowered total cost of ownership (TCO) which includes original cost of the computer and software, hardware and software upgrades, maintenance, technical support and training. Cloud computing also reduced investment and risk for the user and system automation, but there is no open standard available for Cloud computing. Many Cloud service providers (CSPs) do not provide all the services to the client, Portability and interoperability is also impossible between different Cloud Computing Service Providers, which stops the growth and development of cloud computing. Following are the problems existing due to lack of open standards.

1) Limited scalability (ascendable): Most of the cloud computing service providers(CCSP) claim that they provide infinite scalability for the customer, actually, with the widely use of cloud computing and the rapid growth of the users, none of the CCSPs can meet and full-fill all the requirements of all the users.

2) Unavailability of a service: Many of the cloud service providers faced huge problems such as shut down events, as the providers depends only on one CCSP and cannot migrate the application to other providers. Hence, the services get vanished from network.

3) Portability: Absence of portability makes it impossible for data and application to be transferred among CCSPs.

IV. SCHEMES TO OVERCOME THE CHALLENGES

The challenges mentioned above are very common in MCC. Because of these problems, many MCC users are facing problems as they will get locked to certain CCSP and cannot get access to another CCSP. So, to overcome all these challenges the new system is designed. This system will allow the user to access the services that are not available in the CCSP to which the user has registered. The overview of the system is as shown in Fig. 4.

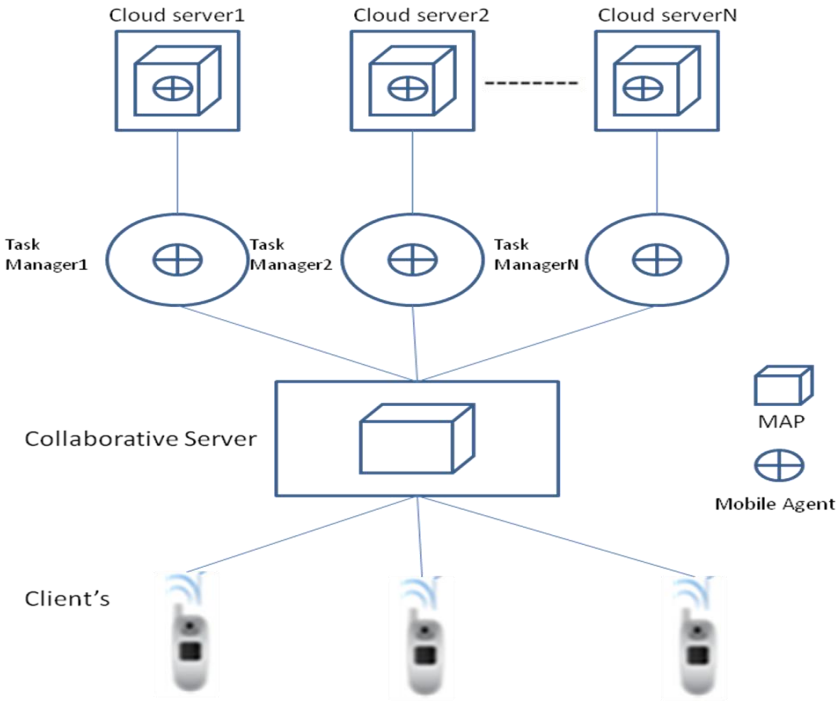

Fig.4: System architecture.

Each client, here mobile user, will have the access to CCSP to which user has registered. As one CCSP cannot provide all the services to user, the user will have to send the service request to another CCSP, which provides that service. For example, as shown in system architecture, client1 is registered with cloud server1, client2 is registered with cloud server2 and so on. If client1 wants some service, client1 will send the request to cloud server1. Cloud server1 will execute the request and send the response back. Now if client1 send the service request that cloud server1 cannot provide, then clien1 will not get any response from server and as clien1 is registered with cloud server1, it will be locked and cannot access to cloud server2 where the service is available. This problem is overcome by proposed system. In this system clien1 can access the services that are not provided by cloud server1 but provided by cloud server2 or any other cloud server.

V. WORKING OF PROPOSED SYSTEM

Accessing the services that are not provided by one CSP but are present in another CSP, there should be some sort of communication between the CSPs. In the proposed model, the communication between different CSPs is carried out by mobile agents. Mobile agents are autonomous programs that can travel from system to system in a network. The state of the running program is saved, while being transmitted to the destination. The program is resumed at the destination continuing its processing with the saved state. They can provide a convenient, efficient, and robust framework for implementing distributed applications and smart environments including improvements to the latency and bandwidth of client-server applications. The communication between CCSPs will be carried out as shown in Fig. 5.

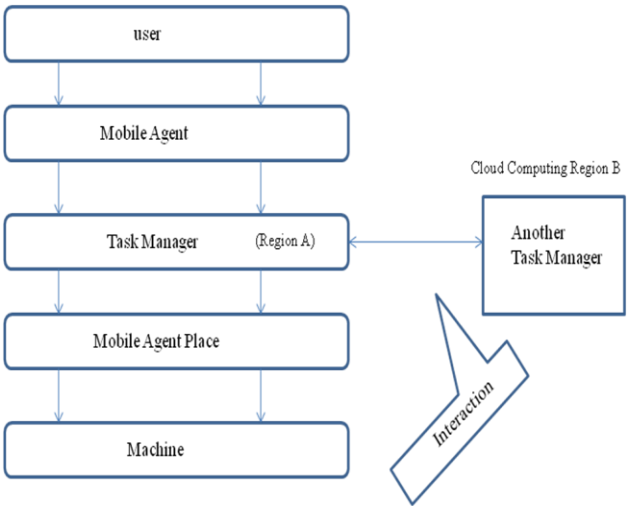

Fig. 5: Interaction between CCSPs

Mobile agent that plays an important role in communication, will have the following fields:

1. Type: The type field specifies whether the request is for computation or a file request.
2. State field specifies :
   a. Object state- values of its instance variable.
   b. Execution State- Its runtime state.
3. Mobile agent code: This field gives the agent code.
4. Application task field: This describes the task to be performed.
5. Security credentials: This field specifies authentication and encryption.
6. Sender ID and receiver ID specifies the sender and receiver.

F ig. 6: Fields in mobile agent.

In the proposed system, all the communication between different CCSPs is carried out by using mobile agent. Mobile agents are the autonomous program which has fields mentioned above. All the fields have important information that is necessary for communication. The type field specifies whether the request is for file or for computation. If the request is for file, the requested file will be returned as response. Mobile agent code field gives an unique identification of user. Security credentials include the encryption of message while communicating so that no third party user can access the message. It also authenticates the user by username and password. So all this information will be carried in a single mobile agent and the secured communication will be carried out between CCSPs.

VI. ADVANTAGES OF MOBILE CLOUD COMPUTING

Mobile cloud applications move the computing power and data storage away from mobile phones and into the cloud, bringing applications and mobile computing to not just Smartphone users but a much broader range of mobile subscribers. Following are the benefits of Mobile Cloud Computing.

- MCC will help to overcome limitations of mobile devices in particular of the processing power and data storage.
- It also helps to extend battery life as all the execution of communication intensive applications is carried out at cloud side.
- MCC can increase security level for mobile devices achieved by a centralized monitoring and maintenance of software.
- It can also become a one-stop shopping option for users of mobile devices since Mobile Cloud Operators can simultaneously act as virtual network operators, provide e-payment services, and provide software, data storage, etc. as a service.

VI. CONCLUSION

The concept of cloud computing provides a brand new opportunity for the development of mobile applications since it allows the mobile devices to maintain a very thin layer for user applications and shift the computation and processing overhead to the virtual environment. A cloud application needs a constant connection that might prove to be an Achilles heel for the cloud computing movement. However MCC has many challenges as portability, interoperability, unreliable service etc. All this challenges can be overcome by the proposed system. The secured communication can be carried out between different CCSPs.

REFERENCES

[1] Dejan Kovachev, Yiwei Cao and Ralf Klamma, "Mobile Cloud ComInformation Systemsputing: A Comparison of Application Models Information Systems and Database Technologies," RWTH Aachen University Ahornstr.klammag@dbis.rwth-aachen.de

[2] M.Rajendra Prasad , Jayadev Gyani, P.R.K.Murti, "Mobile Cloud Computing: Implications and Challenges," Journal of Information Engineering and Applications ISSN 2224-5782 , Vol 2, No.7, 2012.

[3] Hoang T. Dinh, Chonho Lee, Dusit Niyato, and Ping Wang, "A Survey of Mobile Cloud Computing: Architecture, Applications, and Approaches in Wireless Communications and Mobile Computing," Wiley,onlinelibrary. http://onlinelibrary.wiley.com/doi/10.1002/wcm.1203.

[4] Niklas Borselius, "Mobile agent security," Electronics and Communication Engineering Journal, October 2002, Volume 14, no. 5, IEE, London, UK, pp 211 -218 ,Information Security Group, Royal.

