
SECURITY ISSUE AND CHALLENGES FOR MOBILE CLOUD COMPUTING

Pratik Eknath Lone^{*1}

^{*1}Dept. Of Information Technology, BK Birla Collage Kalayn, India.

ABSTRACT

Cloud computing is proving it is an emerging technology in IT world. Mobile Cloud Computing (MCC) is a combination of three main parts, they are mobile device, cloud computing and mobile internet. With the help of MCC, a mobile user gets a rich application delivered over the Internet and powered by cloud-backed infrastructure. MCC provides a platform where mobile users make use of cloud services on mobile devices. The use of MCC minimizes the performance, compatibility, and lack of resources issues in mobile computing environment. The major concern for mobile user is security and protection in mobile cloud computing, Significant amount of research is use to reduce the security concerns but still a lot work has to be done to produce a security prone MCC environment. This paper presents a MCC and its security issues and challenges.

I. INTRODUCTION

Cloud computing is an emerging technology which provides IT services and resources to the customers through public network specifically internet. Mobile device are increasing becoming an essential part of human life as the most effective and convenient communication tool. Not bounded by time and place. The rapid progress of mobile computing (MC) becomes a powerful trend in the development of wireless communications technology as well as commerce and industry fields. MCC is the combination of mobile computing and cloud computing, this provides full access to all technology resources through the cloud "Anytime, Anywhere, Anyhow".

Recently, the MCC is becoming a new hot technology. And the security solution for it has become a research focus. With the development of the mobile cloud computing, new security issues are there, which needs more security approaches.

This paper is organized as follow :-

section 2:- Introduce the concept of mobile cloud computing

section 3:-Architecture of mobile cloud computing

section 4:-Issue and challenges of mobile cloud computing

section 5:-Conclusion and Future goal

section 6:-Reference

II. MOBILE CLOUD COMPUTING

In The mobile cloud computing (MCC) has been inherited from cloud computing soon after the cloud computing era begun around year 2007. Cloud computing is a general term for the delivery of hosted services over the Internet. Mobile Cloud Computing refers to an infrastructure where both the data storage and the data processing occur outside of the mobile device. Due to its attractive business model and the increased number of mobile phone (smart-phone, tablet pc etc) users in the world, the MCC is proving to be a potential future technology. It has also attracted the attention of many businessmen and entrepreneurs as a prospective and lucrative business opportunity. The mobile cloud applications running on the mobile use the computational power and data storage capabilities of the cloud. Mobile devices are increasingly becoming an essential part of human life as the most effective and convenient communication tool. 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).

There are so many cloud storage service providers around e.g. One Drive (Microsoft Corporation), Dropbox (Dropbox Inc), Google Drive (Google Inc), Box, Amazon Cloud Drive and Apple icloud. Cloud computing applications are the cloud-based services e.g. Mobile Email, Google Maps, Google Cloud Print (Google Inc), Other Apps (Real Estate, Insurance, Surveying, Navigation app).

III. ARCHITECTURE OF MOBILE CLOUD COMPUTING

The architecture presented by is the generic architecture of mobile cloud computing (MCC). The security related issues in MCC are introduced in two categories: the security for mobile users and the security for data.

A. Security for Mobile Users: Mobile devices such as cellular phone, PDA, and Smartphone are exposed to numerous security threats like malicious codes (e.g., virus, worm, and Trojan horses) and their vulnerability. In addition, with mobile phones integrated global positioning system (GPS) device, they can cause privacy issues for subscribers.

B. Securing Data on Clouds: Although both mobile users and application developers benefit from storing a large amount of data/applications on a cloud, they should be careful of dealing with the data/applications in terms of their integrity, authentication, and digital rights .

The figure shows that there are two different mobile networks A and B. Each mobile network consists of different mobile user devices which are connected to it through wireless access point, BTS or satellite.

IV. TYPES OF SECURITY AND ISSUE

4.1. Data Security and Privacy Issues

The mobile cloud users have serious concerns about data security in cloud. The data security is the one of the major issue which is main obstacle for the users to move their data to the cloud. Here we have highlighted some common data concerns in the cloud. 1. Data theft risk

1. Privacy of data belongs to customers
2. Violation of privacy rights
3. Loss of physical security
4. Handling of encryption and decryption keys
5. Security and auditing issues of virtual machines International Journal of Grid and Distributed Computing Vol.6, No.6 (2013) 44 Copyright © 2013 SERSC
6. Lack of standard to ensure data integrity
7. Services incompatibility because of different vendors involvement

The concerns in cloud computing around data life cycle are also highlighted which needs to be standardized if we want to motivate the users to adopt cloud data services.

1. Generation of Data
2. Transfer of Data
3. Use and Share of Data
4. Storage
5. Archival and Destruction

In addition to the data security threats on cloud side, there are some attacks which are possible at end user mobile device as well.

1. Device Data Theft
2. Virus and Malware Attacks via Wireless Devices
3. Mis-use of Access Rights

From information security point of view in cloud, we have provided some common information security issues of cloud computing like:

1. System Security of Server and Database
2. Networking Security
3. User Authentication
4. Data Protection
5. System and Storage Protection

4.2. Architecture and Cloud Service Delivery Models Issue

Apart from data and information security, the mobile cloud computing have some general issues in terms of their architecture are highlighted below.

1. Computing off-loading
2. Security for Mobile Users/Applications/Data
3. Improvement in Efficiency Rate of Data Access
4. The Context Aware Mobile Cloud Services
5. Migration and Interoperability
6. Service Level Agreement (SLA)
7. Cost and Pricing

The cloud computing service delivery model has its own issues which are highlighted below. IaaS model security issues:

1. Virtual Machine Security
2. Virtual Machines images repository security
3. Virtual network security

4.3 PaaS model security issues:

1. Structured Query Language related
2. Application Programming Interface Security

SaaS model security issues:

1. Data Security Management
 2. Web Application Vulnerability and Scanning
- 4.3. Mobile Cloud Infrastructure Issues

From cloud infrastructure point of view, a variety of attacks are possible on the cloud. Some of these attacks are given below.

1. Attacks on Virtual Machines
2. Vulnerabilities exists at platform level
3. Phishing
4. Authorization and Authentication
5. Attacks from Local Users
6. Hybrid Cloud Security Management Issues

4.4. Mobile Cloud Communication Channel Issues

A lot of improvement needs to be done at the mobile cloud communication channel. The following attacks which exist at communication channel are:

1. Access Control Attacks
2. Data Integrity Attacks
3. Attacks on Authentication
4. Attacks on Availability

In literature review some generic mobile communication side issues have also been pointed out.

1. Low Bandwidth and Latency problems
2. Availability of Desired Services
3. Heterogeneity
4. Limited Resource

V. CONCLUSION

In this paper, we have presented a complete understanding of MCC by explaining its architecture, advantages and applications. We have SERSC mainly focused on highlighting the issues and challenges of MCC like, data

security, infrastructure security and communication channel security. The main idea behind this research is to identify these issues and challenges because they are preventing the mobile users to take on cloud services. This research is particularly useful for mobile service providers so, that they can improve the security technologies and mechanisms used for cloud security to minimize the user's security concerns. On the basis of the literature review conducted in this paper, we conclude that MCC is regarded to be a potential technology in coming years but currently facing some serious security issues and challenges which limits its adoption among the mobile users.

VI. REFERENCE

- [1] S.O. Kuyoro, F. Ibikunle and O. Awodele, "Cloud Computing Security Issues and Challenges", International Journal of Computer Networks (IJCN), vol. 3, Issue 5, (2011).
- [2] Hoang T. Dinh, Chonho Lee, Dusit Niyato, and Ping Wang. "A survey of Mobile Cloud Computing: Architecture, Applications, and Approaches," Wireless Communications and Mobile Computing, 2011.
- [3] S.c. Hsueh, IY. Lin, M.Y. Lin, Secure cloud storage for conventional data archive of smart phones, in: Proc. 15th IEEE Int. Symposium on Consumer Electronics, TSCE ' II, Singapore, June 2011
- [4] M. Al Morsy, J. Grundy and I. Müller, "An Analysis of The Cloud Computing Security Problem", In Proceedings of APSEC 2010 Cloud Workshop, Sydney, Australia, (2010), November 30.
- [5] Ranbijay Kumar, Dr. S. Rajalakshmi "Mobile Cloud Computing Standard approach to protecting and securing of mobile cloud ecosystems" 2013 IEEE International Conference on Computer Sciences and Applications
- [6] H.T. Dinh, C. Lee, D. Niyato and P. Wang, "A survey of mobile cloud computing: architecture, applications, and approaches", Wireless Communications and Mobile Computing - Wiley, (2011) October.
- [7] A.N. Khana, M. L. M. Kiaha, S. U. Khanb and S. A. Madanic, "Towards secure mobile cloud computing: A survey", Future Generation Computer Systems, vol. 29, Issue 5, (2013) July.
- [8] M.R. Prasad, J. Gyani and P. R. K. Murti, "Mobile Cloud Computing: Implications and Challenges", Journal of Information Engineering and Applications, vol. 2, no. 7, (2012).
- [9] Morshed, M. S. Jahan, M. M. Islam, M. K. Huq, M. S. Hossain and M. A. Basher, "Integration of Wireless Hand-Held Devices with the Cloud Architecture: Security and Privacy Issues", International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC), (2011) October.
- [10] Abdul Nasir Khana, M.L. Mat Kiah a, Samee U. Khanb, Saljad A Madanic, "Towards secure mobile cloud computing: A survey", Future Generation Computer Systems, August 2012
- [11] H. Liang, D. Huang, L. X. Cai, X. Shen and D. Peng, "Resource Allocation for Security Services in Mobile Cloud Computing", IEEE Infocom 2011 Workshop on M2MCN, (2011).