

Mobile Cloud Computing: Security Challenges for Threats Reduction

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Abstract – Nowadays, with the remarkable advances in information technology, mobile cloud computing with the security challenges and with factors privacy and trust is faced. MCC, in cloud computing technology for mobile devices is important. In MCC technology considering the hardware limitations of the device such as mobile phones, tablets and smart phones can be connected to a cloud environment and the opportunities that this environment provided benefit. To provide secure and reliable services in cloud computing environment is one of the most important issues in this technology. MCC is emerging as a new phenomenon in the world of information technology and business is considered highly, so that the promise to deliver and provide a wide range of advantages to their followed. In this paper, we study mobile technology and MCC security challenges facing this technology have discussed. And with respect to services provided in cloud environment, we propose a new MCC to provide security.

Index Terms— Mobile Cloud Computing, Cloud Computing, Security, Privacy, Trust

1 INTRODUCTION

With the advent of cloud computing technology and the widespread use of users of mobile devices, MCC technologies, appropriate mechanisms for information sharing and information exchange between mobile devices has created. MCC to overcome the physical constraints of distance, appropriate solution for online business transactions and services has created. Cloud computing as a new wave of communication technology development has brought to users, and now has the ability to respond to most requests and requirements. But it needs the security challenges of reducing risk factors support this technology, have faced [1]. Security threats is very important for cloud service providers and therefore are trying to use the various techniques of management, security, computational and storage space have secure cloud. MCC is evolving with extraordinary pace, can significantly contribute, agility, and scalability increase [2]. Flexible cloud computing infrastructure using cloud computing, mobile technology, new possibilities for technology to support the activities provided. Mobile users so that can help mobile devices to have access to various resources.

MCC services and offers the promise of a wide range of services and benefits to users are mobile [3]. Mobile cloud computing is a new and important technology in electronic services through mobile devices and users is considered. Nowadays, as new mobile cloud computing services is considered as services over the web. MCC has the potential that enables mobile devices to use this technology without having RAMs and

CPUs of high capacity [4]. MCC, more flexibility, and most importantly it will reduce costs. With cloud computing technology, users can use the of various devices, such as PCs, laptops and mobile phones to store, share, work with the operating system and various applications on the cloud environment are able to access requirements [3]. Most communication and information services on mobile devices, especially in the area of banking and commerce, software, computer games and databases, will be done by MCC [4].

MCC entity established for this purpose, so that people everywhere can get through it all computing resources, storage and applications on the cloud environment using mobile devices and tablets with ease [3]. MCC, computational network is widely used in the future in progress and has many applications in different fields of business and has led to new approaches in the sharing of resources a arise [4]. Using cloud computing, the mobile devices can increase the capacity and efficiency of information sharing in resources. In cloud computing technology, rather than keeping corporate data or software required to pay a fee to use their services in a cloud environment. These services by companies that provides cloud computing infrastructure can be provided to users. Thus, users of the internet can be used for data and applications to a cloud environment. These services can be updated any time, no need to install on your machine you will not have any negative charge on PC and most importantly, the can be matched precisely to your specific needs. Therefore, the development and popularity of mobile devices has led to too close to these two areas of MCC and mobile technology. Cloud technology with concerns, such as lack of permanent access to the internet or threaten the privacy of their users, and effective in providing excellent solution for faster, wider, and has become less expensive [5].

In this paper, we investigate the issues and challenges in cloud computing, mobile, modern and functional solutions for mobile devices in cloud environment offer better services. We have organized the general structure of this paper as follow: In the second section, discussed about the research work done in

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the field of MCC; in the third section, will describe MCC; the fourth section explains to security challenges and confidence in cloud environment; In the fifth section provides recommendations on improving security in MCC environments based on cloud computing is discussed; and finally in the sixth section, we will conclude.

2 RELATED WORKS

Data security issue in the cloud environment in recent years much attention has been. And research in this area is done. In this paper we have discussed some of the work done in the area of security. F.S.Gharehchopogh et al. [6] comments about security in the cloud environment with an emphasis on privacy and trust to accept cloud to improve security, confidence and reduce risks to privacy are provided to encourage the use of this technology. Their goal in this paper identify customers with cloud computing and assess the security situation in some efforts to improve the security of cloud computing. They proposed solution was that the organization as a security trustee and the interface between the provider and the consumer is created and it is purpose secure transmission of data between these two, so that the organization anyone other than the mechanisms and algorithms used for data transfer information may not be and transducer which allows customer organizations can lend your incoming data correctly view or it could be ready to move to cloud environment. P.Gupta et al [3] the three main technologies MCC namely the, architecture, security and challenges of this technology are discussed. In them paper, these three are important issues in cloud computing. In case of supply these three principles, the security services in the cloud for IT security is acceptable. They also examined the challenges and solutions for this technology are discussed. Although it is unreachable absolute security, but creating type of security in cloud environment that demanded access to these technologies, mobile devices are not out of reach.

Some researchers [4] have defined MCC as a technology for mobile devices and Have expression that the technology software, Web-based electronic services and computing resources to users through mobile devices provide. MCC is in addition to the saves costs, allows users to access the latest software and business environment in the cloud. As well as the availability, management and more efficient use of resources of MCC benefits are considered. In order to data protection instructions, as always, security methods, access control and physical protection of mobile devices and data protection should apply. Although mobile devices and cloud environments are confronted the risk, but there is a low-cost measures that use them can greatly reduce the threat and to achieve optimum security.

D.Huang et al [7] is a framework for processing data in mobile environments, using trust management and private providers have been isolated. Trust management model in the paper include identity management, key management, policy enforcement and security. Their model suggests that that the user should have control on their data and are able to move and delete data.

In [8] Researchers have a general survey of MCC and from different aspects are analyzed. They have pointed out in their paper to AAA (Authentication, Authorization, and Accounting) to mobile network operators to provide services in the cloud environment. They goal in this paper identify customers with security situation in MCC and review some of the efforts to improve security in a cloud environment. Process of their customer access to services in "cloud computing" automated modes and should be done more quickly. Also, with the development of e-commerce cloud computing to prevent reduce of data should be in the broad technology reliability, integrity and availability, should be protected.

W.Jia et al [9], a mechanism named Secure Service for Mobile users SDSM (Secure Mobile user-based Data Service Mechanism) presented. The scheme their goal at providing privacy and access control data is stored in the cloud. This mechanism allows the mobile users to securely make use of outsourced data and security management is minimized. The basic idea of SDSM is the not only security management, but rather one of the advantages they have trust the Mobile Cloud.

3 Mcc

Many definitions have been proposed by researchers for MCC. MCC is defined [8]: "MCC refers to data processing and storage infrastructure that can be done outside of mobile devices. In MCC, computing power and data storage away from mobile phones and the cloud can done, MCC is not just smartphone users but also covers a wide range of mobile subscriber".

MCC is a set of hardware, networks mobile, storage devices, services and interfaces to various services on the cloud platform [10]. MCC is a modern and important technology in the development and services of electronic services in a cloud environment to mobile users is considered. Many applications such as Google Gmail, Google Maps and navigation systems are based on MCC. And some applications to applications on the Android platform, MobileME from Apple, LiveMesh from Microsoft, and Motoblur from Motorola are developing and deploying [3].

MCC is a combination of cloud computing and mobile devices [4]. Using the MCC between mobile devices and cloud computing can communicate. Mobile devices are able to make use of MCC, laptop, PDA, smartphone and devices such as these are. Mobile devices communicate with MCC through the base station and radio link (like 3G, Wi-Fi and GPRS) can be done [3]. MCC for users of mobile devices such as the many benefits it will bring resource sharing and application. The high level of MCC technology cost for hardware and software is not required, so end users will reduce costs [8].

In cloud computing, mobility, ability to connect and communicate with any device that has the cloud servers, can be their desired applications in the cloud without the need to install to run. By applying cloud computing on mobile devices to the large volume of applications it can be achieved. Hereby simplifying maintenance and support of applications for users is. If your applications that by providers such as Google and Microsoft have provided for the use of mobile devices, no users have the software installed and running on your phone, can be

receiving services through the cloud of this servers. The main idea MCC is that software instead of the installed on users' mobile devices, placed on one online server in the cloud so that users can use them. In MCC, data storage and processing occurs outside the mobile device [11]. Programs typically run in cloud space and therefore, any mobile device can access the internet, you can run your desired software. Just like electricity for your home or workplace electrical equipment use, not necessary to have a generator or power plant in your home. But rather for the cost you can rent a certain power. Figure .1 the use of MCC technologies is shown.

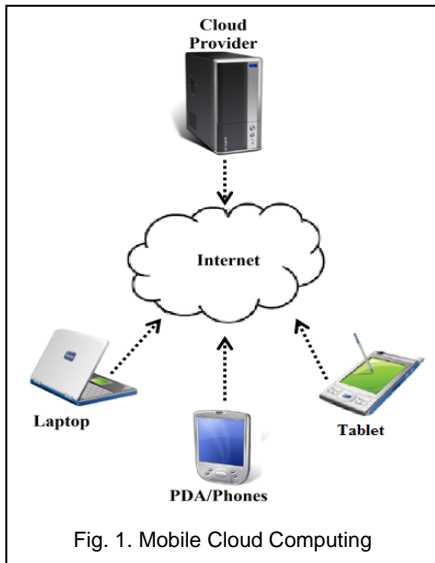


Fig. 1. Mobile Cloud Computing

Since the companies and business organizations are moving applications to on the cloud and these applications every day with new features and more fun to come in the display; Cloud computing technology can be said without any boundary between personal mobile devices via the internet to find everything. In the past different companies, all of your applications that managed on servers and obviously this would require conditions cost and maintenance mode is ideal. From a commercial viewpoint, we can say that these services can now do most of their computing to the cloud services transfer and programs that can be easily installed on your servers, via the cloud can provide to customers [8]. Figure .2 presents a typical MCC architecture.

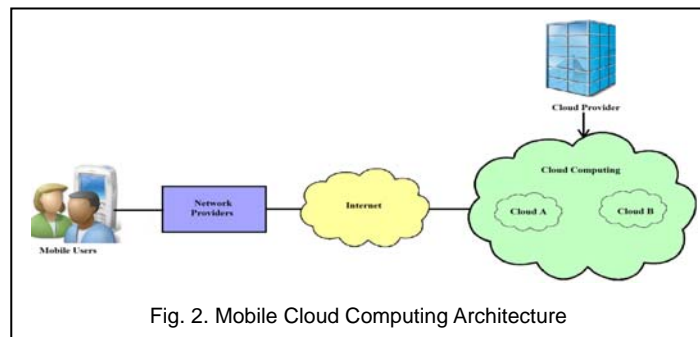


Fig. 2. Mobile Cloud Computing Architecture

In the MCC service, you do not pay for server costs, but rather your payment for the software that do you use. When users on mobile devices do you use cloud applications, in fact, we work with your mobile device, but most from the actual processing is done by a network of servers. These servers can, its processing power to handle the needs of users to increase united. All these events will be integrated, so more often these programs like applications installed on your mobile device to seem.

3.1 Mcc Application

Cloud computing is slowly moving out of the shell theory and has developed over the past and its practical aspects. Today, a variety of services to the mobile user needs, in cloud computing, the mobile devices can provide these services for mobile users. MCC has many advantages, in [8] has pointed to several key features of the technology.

Mobile commerce: commerce through MCC as one of the most important issues in information and communication technology is presented. In m-commerce businesses are using mobile devices [8]. By applying modern techniques such device to ensure safe and secure in the cloud can be to prevent violations from occurring. In[12], the networks of 3G, which is a type of mobile service for users of high-speed internet connectivity enables cloud computing environments is proposed.

Mobile learning: e-learning is based on a technology that does not need to attend programmed classes of users. In [13] a type of e-learning is proposed based on MCC. In other words, this type of education, at any time or place through the MCC using phones or tablets, is possible.

Mobile banking: Mobile banking users to easy access to bank accounts and related services it provides at any time and any place. Users can using the mobile banking main services banking such as information account balances, review account transactions, transfer funds between accounts and pay the bills and etc have access. MCC technologies have a major impact on the improvement of e-banking services and in addition to reduction of problems the current e-banking, as well as reduce the costs associated with information technology. By using m-banking and provide an appropriate framework by cloud providers, users can provide the best services, and have access to banks.

Mobile gaming: Mobile gaming is the way in which gaming are done in cloud environment. To do computer game that are present today, you have a powerful set of hardware such as microprocessors, memory and etc is required. So you will need a computer that can afford to work with large amounts of computational calculations needed to cope with modern day games. The truth is that it enables users to access such services on mobile devices and tablets newest and most complex games without any problems, to try and this is what cloud computing is made possible. Generally, performance of such services can be expressed in this way the game is played on the server and data via an internet connection between the client and server exchange. Using service in environment cloud, Mobile gaming will end with the publication of illegal game. Using mobile gaming also requires users to have not powerful the hardware, the hardware that runs game, the mo-

mobile user is not in the cloud environment.

4 SECURITY AND TRUST IN THE CLOUD ENVIRONMENT

Discuss security issues due to the essence the cloud environment MCC and its role in providing services and advanced services such as e-commerce is very important [8, 14]. Security in the cloud environment system will ensure success [15]. The concept of trust is critical and essential communications in the cloud environment must be clearly defined, because of different researchers have defined it in different ways. Means trust operates a contract that is based on certitude so what promised to be done [1]. Because the success web-based cloud computing, customers are inherently dependent on customer trust is critical to the business in a cloud environment. Lack of consumer trust, often the biggest obstacle to adoption of cloud computing are discussed.

Due to the openness of the cloud environment, crackers can easily make programs such as virus proliferation in the cloud environment. Unauthorized programs can create problems, therefore, it is necessary to carefully to be considered the trust. Researchers in [16] to evaluate the Trusted Computing Platform (TCP) which is a combination of hardware and software are discussed. They also feature the TCP, means encryption, authentication, confidentiality and integrity for more security in cloud environments examined.

Factors to increase customer confidence in cloud environment, effect depends on the security and privacy, usability and perceived fame trust from customers on cloud computing is variable. Commitment cloud providers have a direct relationship the trust and commitment as a mediator variable increase users trust in cloud computing. Another influencing factors is the trust customers satisfaction, customer satisfaction is high correlation to trust e-banking services to their customers. The following questions help to better understand the factors influencing customer trust in the cloud environment.

- What mechanisms can be using the control access to data by users, after their identification, using data provided appropriate security for users and can confirm?
- In MCC environment, various sensitive data through a cloud environment, it is sent or received. In relation to what kind of mechanisms should be used to ensure that sensitive data transmitted (such as credit card information), not read by unauthorized persons and there is no possibility to manipulate them.

The best security solution for Web users, utilize strong security architecture is a framework that has [5].

The main Discussion is trust and security in cloud environments. When trust exists between users is done cloud environment. Undoubtedly one of the factors critical to the success of trust users in the cloud environment cloud computing. Thus to help secure transmission of data in cloud environment to a powerful set of security policies and protocols is required [5].

4.1 Mcc the Security Risks

Security in cloud computing is controversial matter that may

adopt technologies MCC that are using cloud environment delay. Security is a serious issue of concern for the security and especially data confidentiality in MCC. Therefore, the information security environment "cloud" is difficult, because the internet provides access to a cloud environment and security risks associated with internet, the cloud is also discussed. M.Sudha et al. [17] socket programming for secure transmission of data in a cloud environment on the server and client have suggested. In this paper are general socket programming and key exchange for secure transmission of data in a cloud environment are compared.

D.Zissis et al. [18] for security in a cloud environment to eliminate potential threats presented are resistant solutions. The proposed solution is based on encryption to ensure authentication, integrity and confidentiality of transmitted data is in a cloud environment. Highway safety is critical to cloud acceptance of, if technology providers can take this huge obstacle in the way of, or minimize, cloud computing will become the best in the field of information technology [6]. We will mention some security risks related to cloud computing [19, 20].

1. Positioning Data

In the cloud environment, the issue of data an organization or company, wherever located (the host country in which they are or even where the data is located) is very challenging. One step is to secure your data with cloud service provider to agree in a specific geographic area that your data storage and processing. You can also use the legal acts they can committed to respect the integrity of all your data.

2. Isolated Data

Because of the cloud environment, data is stored in a shared environment of many organizations. Therefore customer data in a cloud together have and cloud service provider and the customer must make sure that the data have been isolated.

3. Flexibility Servers

One of the advantages of cloud computing is the fact that this technology brings high flexibility [21]. But this can cause problems, some servers may be configured without notify user renewed. This may be related to a particular organization for the data within the cloud can be challenging. So if this changes continuously applies to data security risks. Despite the benefits and business opportunities of MCC, in this regard there are certain issues and challenges that need to be chosen carefully and the right solution for them. The penetration of mobile devices and use personal information from users via cloud environment, the security threats in cloud computing is mobile. With growing progress of technology, there certainly mobile devices are a security risk. Users of MCC technology, mobile devices, using the cloud to take advantage of others should be concerned about the security of your data. Users in MCC technology, of mobile devices to take advantage of the cloud environment more than others should be concerned about the security of your data [8].

Users of mobile devices are really important to secure your device, using mobile devices to the operating system and hardware based encryption for internal and external memory support. This means that data stored on mobile devices, users are protected against high-level security challenges. Order to use e-commerce in the cloud, an infrastructure must be reliable

ble and safe to be used. For this purpose, should enable user authentication, data integrity and consistency, ensuring company security services and other supplies necessary for the use of cloud technology, be provided. Important and sensitive data security, especially with the Expanding knowledge and technology cloud computing more evident. For security in cloud computing, a set of strategies, policies and mechanisms is needed confidentiality, private and ensure data accuracy [22]. Privacy in a cloud environment must guarantee that attacker can prevent the disclosure of information to members. Stricter policies to prevent access to such data must be established. For example, information relating to financial assets, organizations, personal information, passwords and other confidential information can be considered. Such information must be protected as well as specific security and precautions have to be considered. Because of the modified and distortion of information by hackers may cloud providers fall into jeopardy. So, if the cloud environment for mobile devices, the security is not good, the risk of theft of information or intrusion by unauthorized users, potentially increasing.

5 DISCUSSION

In computer science, the first factor that will ensure the success of a system, the data is secure. Although the data on a central server are protected by complex security procedures but users are still cautious approach to cloud computing and data privacy are maintained mistrust. Because cloud computing is controlled by the server, so users can gain unauthorized access to data and services are perfectly legal and illegal users have. While many users are connected to the grid and cloud computing, this technology may facilitate the transmission of data knows but in the secure exchange of data, often as a basic principle still remains hidden.

Data security for most organizations IT is only a matter of serious irregularities in the data arise. In most cases these problems caused a heavy blow to the organization and the data on it. Review and evaluation of the various cloud computing has always been but the fact that the environment is a huge threat and risks. Today, data security in a cloud environment from a fringe issue to a critical issue has become. Any trade in or transfer of data in a cloud environment must undergo a security control done. If security is not restored in a cloud environment, its many advantages, one of which is MCC is not derived from well and e-commerce services to users, privacy, are subject to manipulation and abuse. But we propose for the creation of infrastructure such as modified protocols transport, data encryption algorithms, implementation of safety management systems, and document security standards security patterns can be more comprehensive view of the technology to ensure the security and integrity of security issues have. The success of such programs in high-level managers to support the full participation department technology cloud computing needs.

The second proposal is to enhance security in a cloud environment of trust. If we can overcome the issue of trust and the trust to create the cloud environment can be just as or even better than internal technology company, provides manage-

ment services, we will see that much on cloud services will be provided. So we have to trust that what we put in the cloud environment, an inclusive, sustained and can be used forever. Just like the people of a state bank, a savings of his life without fear, where the deposits are stored. For example, the Amazon site as the most reliable and trusted web site on the trading book, the book market has been dominated. Millions customer to safely names, addresses and credit card numbers stored in the system for ordering, are available at Amazon. If customers do not trust Amazon or fear that their credit card numbers may have been compromised, never give your personal information and this site would not be losing their privileged position quickly. Amazon company value trust has provided well for our customers.

The third proposal is to raise awareness of security in a cloud environment. Organizations and centers that take advantage of cloud computing, cloud services must conscious choose. They not only need a reliable relationship to the cloud service provider, but rather the maximum possible information about the company and other cloud relevant to gain. As a result, the use of cloud technologies, cloud service provider you elected should be someone that you are aware of him.

The fourth proposed to enhance security in a cloud environment is hard to implement, hard implementation a secure sense of vulnerability by limiting ways. Because of cloud computing, mobile devices can also have access to the environment, so the vulnerability is greater in a cloud environment. Cloud Service Provider must use statistics (such as removing unnecessary software and turn off unnecessary services) that most of them are vulnerable to a cloud environment to prevent unauthorized users.

6 CONCLUSION AND FUTURE WORK

In this paper we review cloud computing and cloud technologies that benefit the environment are discussed. One of these technologies that allow mobile devices to communicate with a cloud environment is MCC. By survey conducted in this paper, we observe that there are many benefits to using MCC, but still many difficulties to implement this technology in the cloud environment are considered a security threat the main problem is lack of trust and privacy in cloud systems and the need for strong security policies achieved by these technologies are creating. In this paper we have also studied the changes that can be created in communications by mobile cloud computing and we have also studied the services that has been provided for users in mobile devices. In the future, we hope with the help of mobile devices and the sharing of information and reduce risk in cloud environments, security services, cloud computing, mobile users will be offered by cloud providers.

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