Dr. Vikesh Sethi, International Journal of Research in Engineering, IT and Social Sciences, ISSN 2250-0588, Impact Factor: 6.565, Volume 09 Issue 06, June 2019, Page 370-373

A Study on Security Service Model in iCloud Environment

Dr. Vikesh Sethi

(Assistant Professor, Department of Computer Science, Manohar Memorial P.G. College, Fatehabad, India)

Abstract: *Security is one of the basic aspects required in any network model. But when the access is on some shared system such as iCloud, the security criticality is increased. This kind of system is defined along with service and resource sharing services as well as to perform the data management effectively. These services are integrated with public as well as private environment. iCloud System, increases the criticality because of available limited resources in mobile devices. The complete security load is handled by the cloud system itself. In this work, a study of secure service architecture is defined. Author defined the study on different service models along with security concerns. The paper discussed, the issues and relative security solution in different layers of cloud system.*

Keywords: *iCloud, Security, SaaS, Mobile Environment*

I. INTRODUCTION

Cloud computing is the evolutionary distributed platform to provide the services, resources and the hardware in an integrated environment to cloud users. It helps a user to use the storage system, hardware and these application software without performing any deployment or installation. Cloud computing is becoming one the most popular technology among the business enterprises because of infrastructure reduction and cost reduction. The users are also attracted to this environment because of fast and integrate service access over the cloud system. The cloud system itself defines different platforms, services, applications to all public, private and limited users. Beyond the effective integration between the cloud servers and clients, it also suffers from security challenges because of its global virtual environment [1][2].

Security is the key issue associated with cloud system that is required on client side as well as on vendor side. The security requirements in this public environment are shown in figure 1. The main consideration among these issues is the authentication and the authorization issue. This security concern shows the threats again the hacking and the malware activity in the cloud system [3][4]. Once the authentication is proven, the next work is to perform the secure communication so that the reliable data will be transferred to cloud server and to client side in secure way. Another security concern of cloud system is the authorization as well as access control.

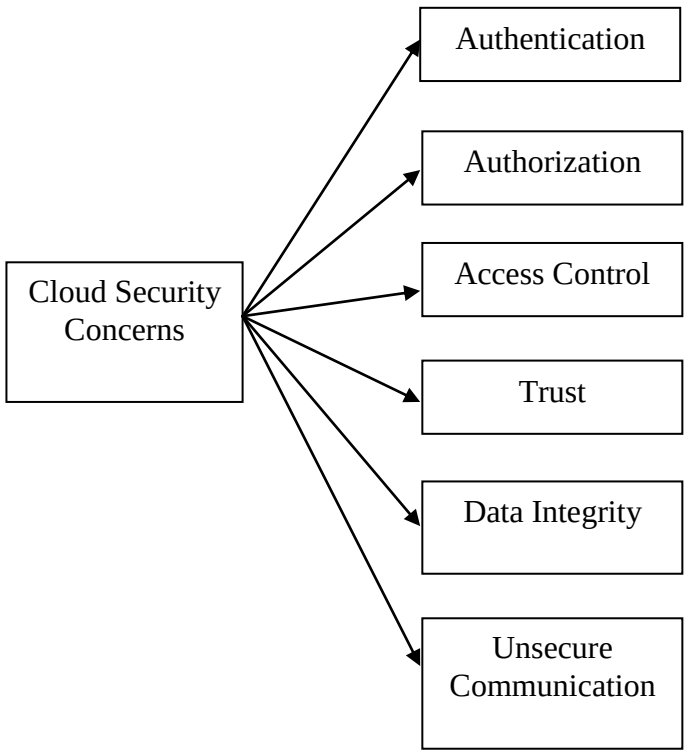

Figure 1: Security Concerns in Cloud System

Authorization is about to avail the services, products or the resources based on the profile match as well as to keep safe the information from others. The profile match defines the user level identification to achieve the security. The trust level analysis also comes under the security specification. The trust is analyzed for the customer as well as the vendor. The trust certificates are distributed to proven the trust. The data integrity is the security issue that deals with the data distortion or the error generation in the data communication or the availability. The most concerned issue in the security system is the communication level security [5][6]. When the data is being transferred, the issue can be in the form of attacks or the incomplete transaction. The session level security is defined to handle these kinds of problems in cloud system.

Cloud Service Architecture

Cloud system is an organized architecture that is defined in several means. One of such effective representation is the service level based architecture. This architecture is defined with three main service layers or the model called IaaS, Paas and SaaS. The IaaS (Infrastructure-as-a-Service) is described as the machine on demand service that avail the physical resources or the hardware in the form of remote service to the customer. PaaS (Platform-as-a-service) is defined as the complete application environment by using which the developers can interacted with development software in a shared remote server system. SaaS (Software-as-a-Service) gives the concept of public cloud where an end user can interact to the system in an integrated environment and multiple vendors are available to provide the requested services [7][8].

In this paper, the security aspects related to the cloud service model are explained. These aspects include the issues and the relative solutions. In this section, the exploration to the cloud system and its security concerns is defined. This section also explained the cloud service model. In section II, the iCloud Architecture is defined. In section III, the work cloud service security models are explained along with issues and the solutions. In section IV, the conclusion of the paper work is described.

II. EXISTING WORK

Security is always one of the most common and open research area, because of this lot of work is already done in the area of security system in cloud environment. In this section, some of the work done by the earlier researchers is discussed.

V. D. Cunsolo performed a work to achieve the information security in distributed system. To resolve the security problem in network based distributed system, author suggested a light weighted cryptographic approach. The objective of work was to provide a secure asymmetric approach to provide secure communication of data as well as file system. Author proposed a secure distributed file system with asymmetric or symmetric structure. Author defined the secure interfacing with cloud and grid based systems [1]. Christian Schridde provided a secure cloud infrastructure based work to provide the security over the cloud system. Author presented a secure infrastructure to provide service over the cloud environment. The work includes the identity based cryptographic model based on public key system. Author provided the cloud based data transmission under the trust analysis. Author also provided the comparative analysis between the approaches [2]. Yingjie Xia defined an ECC model over the cloud system to improve the security on cloud system. Author defined a hybrid ECC system for cloud data. It provided a platform to provide secure file communication, backup system and the resource sharing on distributed cloud. Author provided different security levels for different kind of cloud and avail different secure services with confidential protocol and privacy. Author combined the hash key based cryptography and enhance it using ECC to provide secure user control system[3].

iCloud Environment

iCloud is a substitute to Cloud environment but it also gives the extension to the traditional cloud architecture. This extension is in terms of service and new features included to cloud structure. These services and features are included in the cloud environment in terms of API so that the new integrated cloud storage and synchronization application can be designed. iCloud provides a free service to the storage and fee based architecture so that effective and secure storage of data, photos and other media information can be stored. The cloud environment is defined with big data centers of iCloud servers. Apple provide such cloud architecture so that Application free environment will be generated.
iCloud is fully integrated with mobile devices including the iPhone, iPod, iPad etc. Different platform environment support the iCloud architecture. The Apple TV and computer based operating system so that the use of parts of iCloud, photos and music. This cloud system is defined with SaaS model along with integrated IaaS model. The architecture of iCloud system is shown in figure 2.

Once the iCloud is activated, the user can choose the settings respective to the supported applications. These settings are data oriented to identify iCloud is storing the data or not. There are number of seprate setting page so that the relative options will be selected and identified. iCloud defined the work on internet connection. Author defined the connection based on differnt version of the document. iCloud is specially designed for apple applications. It also controlled by Microsoft Windows and the control panel so that the mails, nodes and photo features will be transmitted effectively.

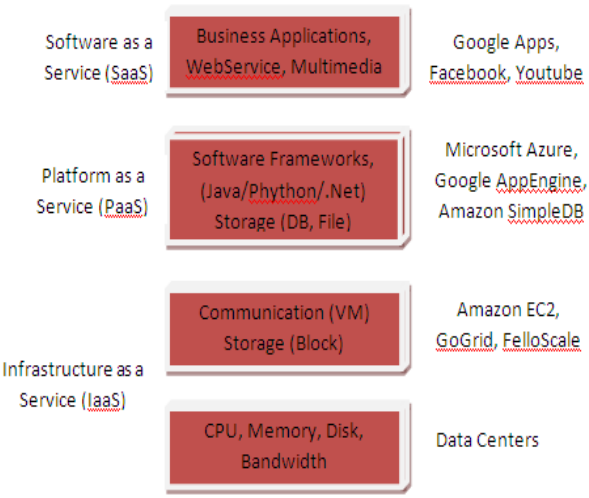

Figure 2: iCloud Architecture

Secure iCloud Service Models

iCloud System architecture is also having the three main service model called IaaS, PaaS and SaaS. These service models are defined under its own responsibilities and the processes integrated with application environment. These service models are defined under the relative security issues. In this paper, these layers of iCloud system are defined along with Security responsibility.

IaaS is one of the infrastructure oriented service provided by cloud environment that deals with the virtual environment the associated devices. These kind of service model are defined with infrastructure sharing and resource sharing systems. The resources are future considered on the server side in different form such as Storage system or the data centers, disk areas etc. It shares the hardware devices virtually. The secure access to these all services and devices is here integrated under the secure environment. The integration of these services and the architecture to the cloud system is done through the mobile client. Client can setup the requirement as well as perform the settings to derive the service constraints. The access to these devices and the storage services comes under the layered security model that includes the authentication, secure communication and encoded information storage. The effectiveness of these security model increases the security definition to the systemThe secure session means the access of the resources as the login performed and provides secure access till the user is logged in to the iCloud system. The most critical attacks issues associated with this service model as well as defined security services or tools are shown in figure 3

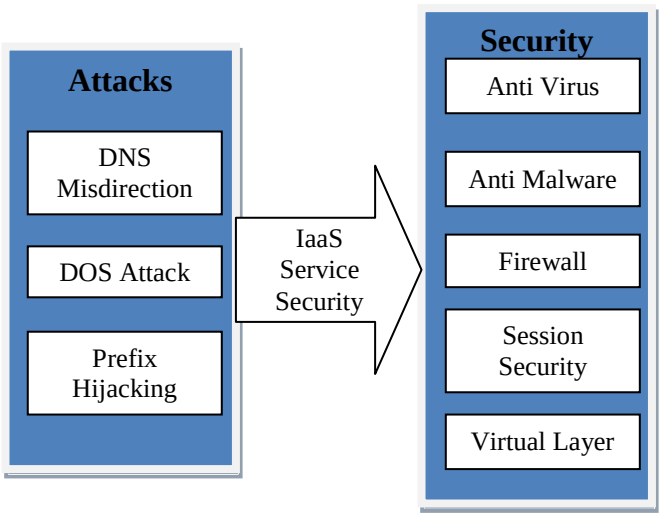

Figure 3: IaaS Service Security Model

As we can see, in figure 1, most critical security issue associated with this service model is availability. The monitoring and auditing tools are applied on this service model to avoid the availability risk. The logical to physical system isolation is also performed to avoid the availability problem. This layer includes the implementation of IPSec, virtual layer, VLAN components to avail the service and resource under high degree of reliability.

III. CONCLUSION

In this paper, an exploration to the iCloud service model and the integrated security aspects is defined. The paper is basically focused on the service models. Each model is described respective the security threats and the security solution so that the effective service gain will be obtained from the iCloud system.

IV. REFERENCES

[1] *Minqi Zhou, Rong Zhang, Wei Xie and Weining Qian, Aoying Zhou, Security and Privacy in Cloud Computing: A Survey. Sixth International Conference on Semantics, Knowledge and Grids., 2010.*

[2] *Jianfeng Yang and Zhibin Chen, Cloud Computing Research and Security Issues. 2010*

[3] *Louis J. Freeh, Keynote talk at InternationalCryptography Institute, Sept. 1995. Available through http://www.fbi.gov/crypto.htm .*

[4] *V. D. Cunsolo, Achieving Information Security in Network Computing Systems, Eighth IEEE International Conference on Dependable, Autonomic and Secure Computing, 2009*

[5] *Christian Schridde, An Identity-Based Security Infrastructure for Cloud Environments, 2010.*

[6] *Yingjie Xia, Hierarchy-Aware ECC Model for Cloud, 2nd International Conference on Industrial and Information Systems, 2010*

[7] *Yanping Xiao, An Efficient Privacy-Preserving Publish-Subscribe Service Scheme for Cloud Computing, 2010*

[8] *M.Venkatesh, Improving Public Auditability, Data Possession in Data Storage Security for Cloud Computing, 2012*

[9] *Vasyl Ustimenko, On some mathematical aspects of data protection in cloud computing, 2012*

[10] *Dexian Chang, TSD: A Flexible Root of Trust for the Cloud, 11th International Conference on Trust, Security and Privacy in Computing and Communications, 2012*

[11] *Chang-Ji WANG, A Key-policy Attribute-based Encryption Scheme with Constant Size Ciphertext, Eighth International Conference on Computational Intelligence and Security, 2012*

[12] *Sahil Madaan, Implementation of Identity Based Distributed Cloud Storage Encryption Scheme using PHP and C Languages on Linux Platform, 2nd IEEE International Conference on Parallel, Distributed and Grid Computing, 2012*

[13] *Tamal Kanti Chakraborty, Enhanced Public Auditability & Secure Data Storage in Cloud Computing, 2012*