

## A Design of Access Control Framework for User Identification Based on Personal Cloud

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**Abstract.** A variety of terminal user due to continued growth and popularization of smart phone make increase the demand for the free access. So the amount of personal cloud service user is increasing steadily and the researching institutions are emphasizing the importance of personal cloud. However, the invasion to increasing user data and security is spreading and there is succession for security risk occur in existing cloud service circumstances. Therefore this paper designed secure and accessible security framework with designing user identification and key management on personal circumstances. And it also designed access control model that authorize user with generating user identification based on key.

**Keywords:** Personal Cloud Computing, Security Framework

### 1 Introduction

Recently, the cloud computing service for personal user is being study due to the attention about cloud computing technology that supporting computing resources with virtualizing technology. The market research institution 'Forrester Research' defines these kind of services 'personal cloud'. Also, 'Gartner' the global research advisory board confirm the importance of personal cloud service through announcement about personal cloud, hybrid IT and cloud computing as '10 strategy technology 2013'. In addition, the demand about free access to personal contents due to the popularization and increasing of smart phone [1-3].

However due to the increasing of personal cloud storage service user, the concern about privacy invasion is spreading. Also it success security risks because it allows variable access of terminal such as PC, Smart phone, smart TV and user information can be leak when it lost. So personal cloud has many similar points because it based on cloud computing, however the studies about appropriate security framework because it is user oriented cloud service [4] [6].

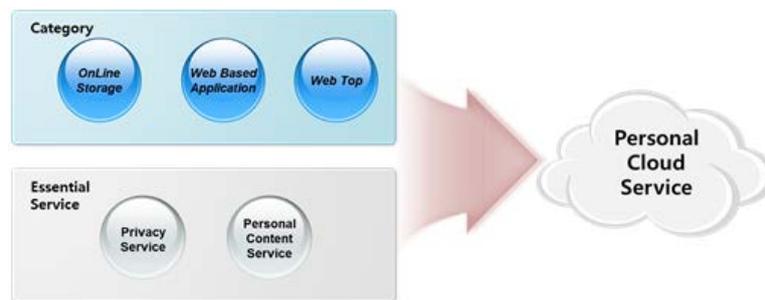
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So this paper suggests the design of access control framework that authorizing user with user identification value and key managing object.

## 2 Related Work

Personal cloud service consists of service categories and two essential services like below [fig 1]. First, the service can divided to online storage, web-based application, and weptop. The user can take advantage the personalized service is available on network-connected circumstance whenever and wherever. In addition, essential service factors should be guaranteed for user personal information, data, security about contents[3-4].



**Fig. 1.** Personal Cloud Service Construction

### - Online Storage

Online Storage is the service supports space for up/download important data whenever and wherever. However, the secure for user's careless damage or malicious access from virus and other online users is required and the availability about real-time services should be guaranteed[3].

### - Web-Based Applications

Web-Based Applications is defined to easy software on browser through internet or intranet and the demand of it is increasing steadily. So it takes advantages that immediate service and maintain without install on user's devices[4].

### - Webtop

No matter where the user is, this service supports information share function coherently wherever the Internet is available. It has the functions for address book, e-mail, file share through user information synchronization[4].

### - Personalized Content Service

Personalized Content Service supports public contents management circumstances, user's received media contents, and private information such as users mail account, address book, schedule management, history. In addition, it possess and support

managing tools and personal researching services. However it should support the services about management of personal contents and variance system with each devices and web services[6].

- Privacy service

Personal cloud service which is based on personal user information requires personal information security. So when the data transferred, it should be enciphered for protection of personal user information and data. In addition in terms of data saving and management, user data should be protected safely even if the data leak[7-8].

### 3 Proposed Routing Protocol

The frame structure suggested in this paper is like below [fig 2]

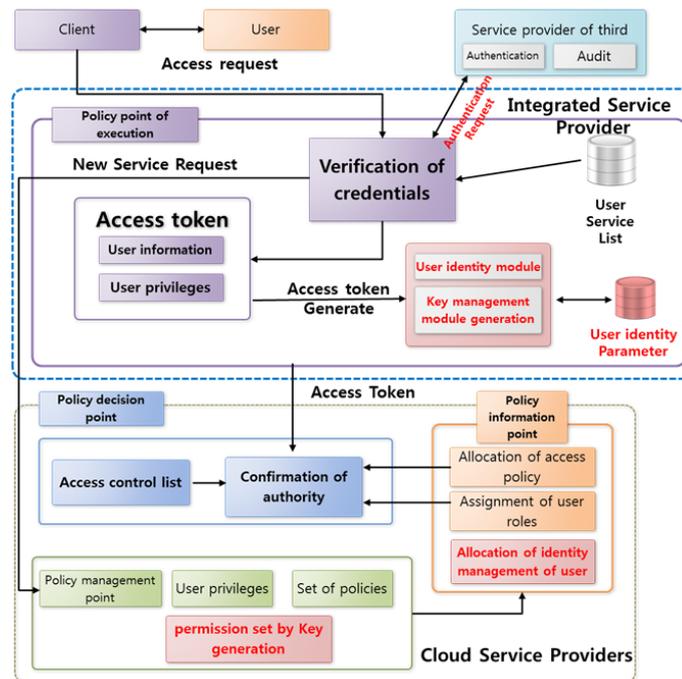


Fig. 1. Proposed Frame Structure

On personal cloud access control model, added object and module which written by red text supplements the security part as suggested framework. The added parts are designed to manage with reinforce the security about user access control and private privacy by using User identity module , Key management module generation, User identity, permission set by Key generation, Allocation of identity management of user. The access control process to user in suggested framework on this paper as follows:

1. The user requires for access to combination service supplier through client device. When the user requires for incipient access, the user transfer it with ID, PW and parameter of device.

2. combination service supplier generates hash value by using user parameter through confirm user information through access token to user verification of credentials.

$$User_i = \text{Hash} ( \text{Info}_{User} \oplus \text{Parameter}_{User}, \text{Identity Value}_{User} )$$

3. After Identification from the third party service supplier by using user ID and PW, generate user authority key through combining identification value and authentication value and hash value.

$$\text{Key}_{User} = ( \text{User}_i \parallel \text{Cert}_{User} )$$

4. Forward, the cloud service supplier confirm permission set by Key generation in policy management and transfer the result value data to policy information object.

$$\text{Data}_{User-i} = \text{User}_i, \text{Info}_{User}$$

5. The object received the data transfer the date to policy decision object after searching access policy, user roles, user identification key management value.

6. The object received the data confirm control access list and start service authorizing appropriate user.

#### 4 Safety Analysis

This chapter analyzed the security of existing standard framework and suggested framework comparatively. [Table-1] analyzed comparatively with referring personal cloud access control requirement.

**Table 1.** Analysis of safety and existing systems

	Existing security frameworks	Proposed Security Framework
Compatible with the security policy and Web services, existing	Support	Support
Development of security policy independent	No Support	Support
Privacy protection	No Support	Support
Cloud Service Level Agreements	No Support	Support

In terms of compatibility with existing security system, the service can be supplied due to it designed with using cloud-based security policy and system. In addition, independent security policies are established and personal user privacy is guaranteed by using user identification value. Finally, SLA-based access control policy is established by designing permission set by Key generation, Allocation of identity and management of user.

## 5 Conclusion

In this paper, access control protocol had designed through adding key management and generate object, user identification object. The more secure access control module had designed with user's private identification value on personal cloud circumstances. Also designing key management protocol authorizes the user with transferring appropriate key after user identification.

Forward, we will design the same protocol such as Identification, Communication, Authorization, Key generating for each user through thorough design of suggested protocol so the studies for the efficiency and security with existing system is required. In conclusion, the study about the compatibility with existing cloud system that lots of users are using is essential.

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