Multiple Data Sharing Using Key Aggregate Cryptosystem in Cloud Storage

Shubhangi Suryawanshi[1], Saad Ali[2], Neha Pawar[3], Priyanka Sengar[4], Sayali Jaid[5]
[1, 2, 3, 4, 5] GHRIET, Pune.

Abstract- *As the development of new wireless technology is growing data sharing becomes a vital part in cloud storage. Sharing of data efficiently and in secured manner is of great importance. In this paper, a cryptographic technique having secret keys can be aggregated to a compact single key by encompassing the power of all keys. This enables the secret key holder to release a fixed size aggregate key for any choices of cipher text set in cloud storage.*

Keywords- Cloud storage, Cryptographic technique, Data sharing, cipher text, Aggregate key.

I. INTRODUCTION

With the rapid development in technology, the use of cloud storage (CS) has grown in recent times. Each and every organization, company has a CS to backup the data for security reasons. The information is stored in cloud so that it can be accessed directly by the employee/company as and whenever required. However the crucial or important data stored on cloud has the chance of leakage. Innovation and administrations in CS, is standard for clients to influence CS administrations to exchange data to others in a companion circle, e.g., AWS Cloud.

In order to share this information it should be securely transmitted. To avoid leakage of data while sharing various methods are available such as: security mediator, oruta etc. They all use third party auditor to handle cloud data.

Cryptography is the content's scrambling of the data, e.g. content, image, sound, feature to make the information indistinguishable irrespective of transmission or capacity is known as Encryption. Furthermore, primary part of cryptography is to deal with information security from intruders. The inverse technique of obtaining back the original information from scrambled data is known as Decryption which restores the first information. Scrambling of information at CS uses both symmetric-key and unbalanced key for calculations. Cloud computing is developing as a huge stage for putting away, keeping up and sharing information. Interest for keeping data secured as well as its storage capacity is expanding in all sphere, whether clients are from corporate, military, IT associations etc.

Information protection has turned into a vital affinity towards the CS clients. Clients don't compromise their privacy.

Security is a noteworthy concern, while sharing the information. Considering an example of clinic administration framework where specialists and patients are getting to the cloud for information sharing about illness and medicines. The patient information is transferred by specialist on the cloud, yet he is unhappy with the security principles of cloud. Therefore, the specialist chose to encode all his data and later transfer the records unto the cloud. Following three days one of the patients asked for the data applicable to him. The unscrambling key will be appointed to the patient do effectively obtain the original information.

To overcome above obstacles while sharing the information, a technique is used to "Encode all information with disparate encryption key and send just single decoding key. This single unscrambling key has the capacity to decode the right content. The promising element of decoding key is that, it is total of the whole unscrambling key yet it stays minimal in size as a single key. The hosts included in correspondence ought to have the capacity to screen the security breaks, henceforth an interruption location framework ought to be given".

In this paper, we propose a simple, efficient, and publicly verifiable approach to ensure cloud data security while sharing between different users. Since we introduce here, Key-Aggregate Cryptosystem. Cryptographic methods are usually applied to address this data sharing issue.

II. LITERATURE SURVEY

Table 1.

PAPER	DESCRIPTION	ADVANTAGES	DISADVANTAGES
Key-Aggregate Cryptosystem for Scalable Data Sharing in Cloud Storage (2014)	Introduction to Key Aggregation Cryptosystem.	1.It is more secure. 2.Decryption key is sent via a secure channel and kept secret	The predefined bound of the number of maximum cipher-text classes.
"Privacy-Preserving Public Auditing for Secure Cloud Storage(2013)	It is necessary to allow a public audit for integrity of outsourced data through third party auditor (TPA).It checks the correctness of the outsourced data.	1.Public audit-ability, 2.Storage 3.Correctness, 4.Privacy preserving,	1.No guarantee of data integrity. 2.No guarantee of availability
"Storing Shared Data on the Cloud via Security-Mediator" (2013)	Security mediator (SEM) is approach allows the user to preserve the anonymity.	1.Public Verifiability 2.Anonymity. 3.Data Privacy.	1.Does not provide the high security. 2.Unable to preserve identity of data owners to public verifiers
"SPICE - Simple Privacy-Preserving Identity-Management for Cloud Environment" (2012)	Preserving the privacy and also maintaining users identity	1.Digital Identity Management, 2.Interoperability, 3.Delegation, 4.Privacy, 5.Unlinkability	1. To create a fuzzy-IBE where the attributes come from multiple authorities
"Shared and Search able encrypted data for untrusted servers" (2011)	To securely encrypt keywords, keyword encryption scheme is also obtained by proxy encryption scheme and proxy cryptography.	1.Does not require a trusted data server. 2.System has a unique set of keys.	1. It Track unnecessary network. 2.The number of user increase then difficulty may arise in key management process
"Achieving Secure, Scalable, and Fine-Grained Data Access Control in Cloud Computing" (2010)	This system provides the solution for the problem of fine-grainedness, scalability, and data confidentiality of access control in cloud storage. Attribute-based encryption (ABE), proxy re-encryption, and lazy re-encryption techniques.	1.User access privilege confidentiality. 2.User secret key accountability.	1.Exchanging the key. 2.Third party can attack the key easily.
"Secure Provenance: The Essential of Bread and Butter of Data Forensics in Cloud Computing" (2010)	SP scheme is used provide security and trusted evidences for data forensics in cloud computing. Provable security techniques are used to check the validity of the security.	1.Information confidentiality 2.Anonymous authentication 3.Provenance tracking.	1.Lack of control 2.Security and privacy. 3.Higher operational cost. 4.Reliability
"Improving Privacy and Security in Multi-Authority Attribute-Based Encryption" (2009)	Multi-authority attribute-based encryption allows real time deployment of attribute based privileges as different attributes are issued by different authorities.	1.Removes the trusted central authority. 2.Protects the users' privacy	1.Difficult handling for bulky users due to load n PKG. 2.Central Authority is required.
"Attribute-Based Encryption for Fine-Grained Access Control of Encrypted data" (2006)	Another way for sharing encrypted data is Attribute-Based Encryption (ABE). It is likely to encrypt the data with attributes which are equivalent to users attribute rather than only encrypting each part of data.	1.Supports delegation of private keys	1.Key escrow problem.
"Practical techniques for searches on encrypted data" (2000)	The proofs of security with the help proposed cryptographic scheme. It supports searching functionality without losing the confidentiality of the data.	1.They are provably secure; 2.They support controlled and hidden search and query isolation. 3.They are simple and fast	1. No space and communication over- using an index is that storing and updating the index can be of substantial overhead.

III. SCOPE OF WORK

Data sharing in cloud storage is of great importance as it allows bloggers to let their friends view a part of their personal images; an organization may grant access to a portion of sensitive information to their employees. The major problem is to effectively share the encrypted data. However, users can download the encrypted information from the CS, decrypt them, and then send them to others for sharing. Users should be able to confine the access rights of the sharing data to others so that they can access these data from the server directly. However, finding an efficient and secure way to share partial data in CS is important.

IV. PROPOSED SYSTEM

To eliminate the leakage/conning/ hacking of information, more secured method is used for encryption and decryption. Here Alice encrypts files with distinct public-keys, but only sends Bob a single (fixed-size) decryption key. As the decryption key should be sent via a secured channel and kept secret, small key size is always desirable. For example, we cannot use large storage for decryption keys in the resource-constraint devices like smart phones, smart cards or wireless sensor nodes.

The Key-Aggregate Cryptosystem (KAC) [1] affords an outstanding performance reducing The estimation intricacy

of the overall algorithm. The KAC assemblages diversified cipher texts into encode text classes and every class keeps a secret key from which the aggregate key will be generated.

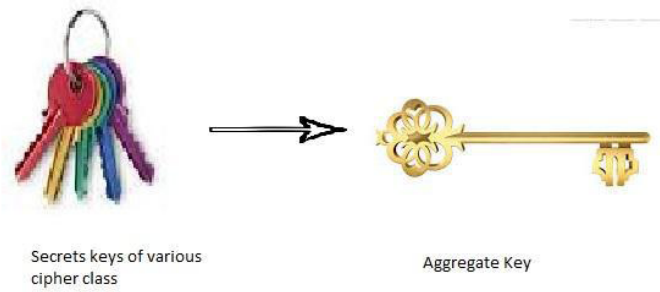

Figure 1. Multiple secret keys to single powerful Aggregate Key

Alice can send to bob the aggregate key as an email so that Bob can decrypt the set of data which is being encrypted using The aggregate key and the set outside this encryption remain Hidden to bob. Another advantage of this scheme is that the Size of cipher text, aggregate key and the master secret key Remains constant.

Especially, these secret keys are usually stored in the tamper-proof memory, which is relatively expensive. The present research efforts mainly focus on minimizing the communication requirements (such as bandwidth, rounds of communication) like aggregate signature. However, not much has been done about the key itself.

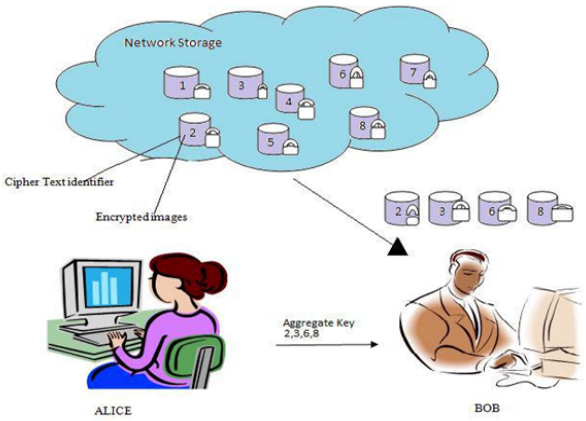

Figure 2. System Architecture

Advantages of Proposed System:

- It is more secure.
- Decryption key is sent via a secure channel and kept secret.
- It is an efficient public-key encryption scheme which supports flexible delegation.

V. IMPLEMENTATION

A. Setup Phase

The setup algorithm takes no input other than the implicit security parameter. The data owner executes the setup phase for an account on cloud storage.

B. Key Gen Phase

This phase is executed by data owner to generate the public or the master key pair (pk, msk).

C. Encrypt Phase

Encrypt (PK,M, A). The encryption algorithm takes as input the public parameters PK, a message M, and an access structure A over the universe of attributes. The algorithm will encrypt M and produce a cipher-text CT such that only a user that possesses a set of attributes that satisfies the access structure will be able to decrypt the message. We will assume that the ciphertext implicitly contains A.

D. Extract Phase

Extract(msk,S) On input the mastersecret key msk and a set S of indices corresponding to different classes, it outputs the aggregate key for set S denoted by KS.This is executed by the data owner for delegating the decrypting power for a certain set of cipher-text classes to a delegate.
Input = master-secret key mk and a set S of indices corresponding to different classes.
Outputs = aggregate key for set S denoted by kS.

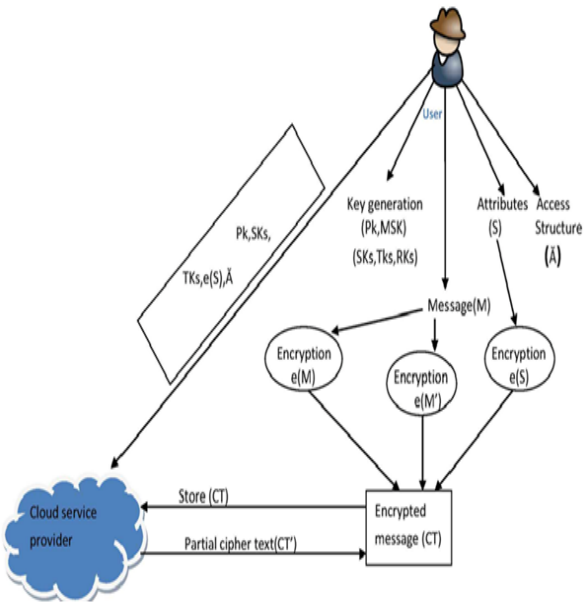

Figure 3.

E. Decrypt Phase

This is executed by the user who has the decryption authorities. Decrypt (kS, S, i, C), the decryption algorithm takes input as public parameters pk, a ciphertext C, i denoting ciphertext classes for a set S of attributes.

Mathematical Model

Set Theory

Let S be the File Stored

S= {.....}

1. let S be the System
   S= {.....}
   Set S is divided into 2 modules
   S= S1, S2
   S1= GUI Module
   S2= Security Module
2. S1:GUI Module
   S1=U,P
   U=Set Of Users
   P=Set of Password
   U=UEfU1,.....,Ung
   P=PEfP1,.....,Png
   Authentication(Ui==Pi)

Success: Successful Login

Failure: Login Failure

3.

S2:Security Module

S2:fS,KeyG,En,Ex,Dg
Setup(1,n)
Mk=fM1,M2,...,Mng
KeyG=fPk,mskg
En=fPk,i,Mig
Pk=Public key
i=index of ciphertext
Mi=Message
Ex=fmsk,Sg
msk=master secret key
S=S E Mk (Subset of Mk)
i=i E S (index of ciphertext)
D=fKs,S,i,Cig
Ks=Aggregate Key
Ci=Ciphertext

Success : Access to plaintext file successful

Failure : Access Denied

VI. RESULT

We have successfully tested the system, the various outcomes were as follows:

- The key generation module helps user by providing the secured key which is used for both encryption and decryption.
- The encryption module provides security for confidential files by encrypting the file with the help of key generated by Key Generation algorithm.
- The decryption module provides the original confidential file by converting cipher text into plain text using the decrypt key.

VII. CONCLUSION AND FUTURE SCOPE

How to protect users data privacy is a central question of cloud storage. With more mathematical tools, cryptography schemes are getting more versatile and often involve multiple keys for a single application. In this article, we consider how to compressed secret keys in public-key cryptosystems which support delegation of secret keys for different cipher text classes in cloud storage. No matter which one among the power set of classes, the delegatee can always get an aggregate key of constant size. Our approach is more flexible than hierarchical key assignment which can only save spaces if all key-holders share a similar set of privileges.

VIII. ACKNOWLEDGEMENT

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