# A SECURE ANTI-COLLUSION DATA SHARING SCHEME FOR DYNAMIC GROUPS IN THE CLOUD

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***Abstract*-Benefited from cloud computing, users can achieve an effective and economical approach for data sharing among group members in the cloud with the characters of low maintenance and little management cost. Meanwhile, we must provide security guarantees for the sharing data files since they are outsourced. Unfortunately, because of the frequent change of the membership, sharing data while providing privacy-preserving is still a challenging issue, especially for an untrusted cloud due to the collusion attack. Moreover, for existing schemes, the security of key distribution is based on the secure communication channel, however, to have such channel is a strong assumption and is difficult for practice. In this paper, we propose a secure data sharing scheme for dynamic members. Firstly, we propose a secure way for key distribution without any secure communication channels, and the users can securely obtain their private keys from group manager. Secondly, our scheme can achieve fine-grained access control, any user in the group can use the source in the cloud and revoked users cannot access the cloud again after they are revoked. Thirdly, we can protect the scheme from collusion attack, which means that revoked users cannot get the original data file even if they conspire with the untrusted cloud. In our approach, by leveraging polynomial function, we can achieve a secure user revocation scheme. Finally, our scheme can achieve fine efficiency, which means previous users need not to update their private keys for the situation either a new user joins in the group or a user is revoked from the group**

***Keywords- Access control, Privacy-Preserving, Key distribution, cloud computing***

## 1. INTRODUCTION

Cloud computing, with the characteristics of intrinsic data sharing and low maintenance, provides a better utilization of resources. In cloud computing, cloud service providers offer an abstraction of infinite storage space for clients to host data. It can help Clients reduce their financial overhead of data managements by migrating the local managements system into cloud servers. However, security concerns become the main constraint as we now outsource the storage of data, which is possibly sensitive, to cloud providers. To preserve data privacy, a common approach is to encrypt data files before the clients upload the encrypted data into the cloud.

Unfortunately, it is difficult to design a secure and efficient data sharing scheme, especially for dynamic groups in the cloud. A cryptographic storage system that enables secure data sharing on untrustworthy servers based on the techniques that dividing files into file groups and encrypting each file group with a file-block key. However, the file-block keys need to be updated and distributed for a user revocation; therefore, the system had a heavy key distribution overhead. However, the complexities of user participation and revocation in these schemes are linearly increasing with the number of data owners and the revoked users. The techniques of key policy attribute-based encryption, proxy re-encryption and lazy re-encryption to achieve fine-grained data access control without disclosing data contents. However, the single-owner manner may hinder the implementation of applications, where any member in the group can use the cloud service to store and share data files with others. However, the scheme will easily suffer from the collusion attack by the revoked user and the cloud.

The revoked user can use his private key to decrypt the encrypted data file and get the secret data after his revocation by conspiring with the cloud. In the phase of file access, first of all, the revoked user sends his request to the cloud, then the cloud responds the corresponding encrypted data file and revocation list to the revoked user without verifications. Next, the revoked user can compute the

Decryption key with the help of the attack algorithm. Finally, this attack can lead to the revoked users getting the sharing data and disclosing other secrets of legitimate members.

Unfortunately, the secure way for sharing the personal permanent portable secret between the user and the server is not supported and the private key will be disclosed once the personal permanent portable secret is obtained by the attackers.

In this paper, we propose a secure data sharing scheme, which can achieve secure key distribution and data sharing for dynamic group. The main contributions of our scheme include:

1. We provide a secure way for key distribution without any secure communication channels. The users can securely obtain their private keys from group manager without any Certificate Authorities due to the verification for the public key of the user.

2. Our scheme can achieve fine-grained access control, with the help of the group user list, any user in the group can use the source in the cloud and revoked users cannot access the cloud again after they are revoked.

3. We propose a secure data sharing scheme which can be protected from collusion attack. The revoked users can not be able to get the original data files once they are revoked even if they conspire with the untrusted cloud. Our scheme can achieve secure user revocation with the help of polynomial function.

4. Our scheme is able to support dynamic groups efficiently, when a new user joins in the group or a user is revoked from the group, the private keys of the other users do not need to be recomputed and updated.

5. We provide security analysis to prove the security of our scheme. In addition, we also perform simulations to demonstrate the efficiency of our scheme.

## II. EXISTING SYSTEM

In existing techniques of key policy attribute—based "encryption, proxy re-encryption and lazy re-encryption to achieve fine-grained data access control without disclosing data contents. However, the single—owner manners may hinder the implementation of applications, where any member in the group can use the cloud service to store and share data files with others. A secure provenance Scheme by leveraging group signatures and cipher text-policy attribute-based' encryption techniques.

Each user obtains two keys after the registration while the attribute key is used to decrypt the data. A secure access control scheme on encrypted data in cloud storage by invoking role—based encryption technique. It is claimed that the scheme can achieve efficient user revocation that combines role-based access control policies with encryption to secure large data storage in the cloud. Unfortunately, the verifications between entities are not concerned scheme easily suffer from attacks, for example, collusion attack can lead to disclosing sensitive data files.

### *A. Disadvantages*

- The private key will be disclosed once permanent portable secret is obtained by the attackers.
- Easily suffer from attacks.

## III. EXPERIMENTAL WORK

### *A. Proposed system*

We propose a secure data sharing scheme, which can achieve secure key distribution and data sharing for dynamic group. The main contributions of our scheme include the secure way for key distribution without any secure communication channels. The users can securely obtain their private keys from group manager without any Certificate Authorities due to the verification for the public key of the user. Our scheme can achieve fine-grained access control, with the help of the group user list, any user in the group can use the source in the cloud and revoked users cannot access the cloud again after they are revoked. We propose a secure data sharing scheme which can be protected from user in the group can use the source in the cloud and revoked users cannot access the cloud again after they are revoked. We propose a secure data sharing scheme which can be protected from collusion attack. The revoked users can not be able to get the original data files once they are revoked even if they conspire with the untrusted cloud. Our scheme can achieve secure user revocation with the help of polynomial function. 4. Our scheme is able to support dynamic groups efficiently, when a new user joins in the group or a user is revoked from the group, the private keys of the other users do not need to be recomputed and updated.

### *B. Advantages*

- Achieve secure key distribution and data sharing for dynamic group.

- The users can securely obtain their private keys from group manager without any Certification Authorities.
- It can be protected from collusion attack.
- It is able to support dynamic groups efficiently.

## IV. ALGORITHM

In this project we use two algorithms, they are,

- ✓ Symmetric key algorithms
- ✓ Asymmetric key algorithms

### *A. Symmetric Key Algorithm*:

Any communication in the language that you and I speak that is the human language, takes the form of plain text or clear text. That is, a message in plain text can be understood by anybody knowing the language as long as the message is not codified in any manner. So, now we have to use coding scheme to ensure that information is hidden from anyone for whom it is not intended, even those who can see the coded data.

Cryptography is the art of achieving security by encoding messages to make them non-readable. Computer security and engineering. Cryptography is used in applications present in technologically advanced societies; examples include the security of ATM cards, computer passwords and electronic commerce, which all depend on cryptography.

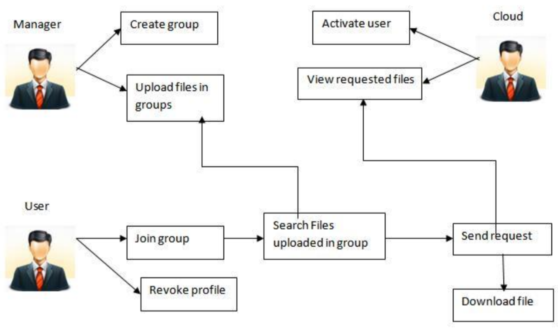
Symmetric key algorithms are the quickest and most commonly used type of encryption. Here, a single key is used for both encryption and decryption. There are few well-known symmetric key algorithms i.e. DES, RC2, RC4, IDEA etc. This paper describes cryptography, various symmetric key algorithms in detail and then proposes a new symmetric key algorithm. Algorithms for both encryption and decryption are provided here.

### *B. Asymmetric Key Algorithm*

Public or asymmetric key cryptography involves the use of key pairs: one private key and one public key. Both are required to encrypt and decrypt a message or transmission. The private key, not to be confused with the key utilized in private key cryptography, is just that, private. It is not to be shared with anyone.

The owner of the key is responsible for securing it in such a manner that it will not be lost or compromised. On the other hand, the public key is just that, public. Public key cryptography intends for public keys to be accessible to all users. In fact, this is what makes the system strong. If a person can access anyone public key easily, usually via some form of directory service, then the two parties can communicate securely and with little effort, i.e. without a prior key distribution arrangement.

## V. SYSTEM ARCHITECTURE



### *A. Modules*:

- ✓ Create cloud server Account
- ✓ CSP(Cloud Server provider) Account permission
- ✓ Manager Creating Group
- ✓ Communicate Group Without Collusion

### *B. Create Cloud Server Account*

Registration:

In this module, a user has to register first, and then only he/she has to access the data.

Login:

In this module, any one of the above mentioned person have to login, they should login by giving their email and password.

### *C. csp (cloud server provider) Account Permission*:

In cloud computing, cloud service providers offer an abstraction of infinite storage space for clients to host data. It can help clients reduce their financial overhead of data managements by migrating the local managements system into cloud servers.

To preserve data privacy, a common approach is to encrypt data files before the clients upload the encrypted data into the cloud. Unfortunately, it is difficult to design a secure and efficient data sharing scheme, especially for dynamic groups in the cloud.

### *D. Manager Creating Group*

- ✓ In this Module Manager (Owner), uploads the files (along with Meta data) into databases, with the help of this metadata and its contents, the end user has to download the file.
- ✓ The Uploaded file was in Encrypted form, only registered user can decrypt it. Even CSP can only view the encrypted file form.
- ✓ We propose a secure data sharing scheme for dynamic members. Firstly, we propose a secure way for key distribution without any secure communication channels, and the users can securely obtain their private keys from group manager. Secondly, our scheme can achieve fine-grained access control, any user in the group can use the source in the cloud and revoked users cannot access the cloud again after they are revoked.

### *E. Communicate Group Without Collusion*

- ✓ We must provide security guarantees for the sharing data files since they are outsourced. Unfortunately, because of the frequent change of the membership, sharing data while providing privacy-preserving is still a challenging issue, especially for an untrusted cloud due to the collusion attack.
- ✓ Moreover, for existing schemes, the security of key distribution is based on the secure communication channel, however, to have such channel is a strong assumption and is difficult for practice.
- ✓ We propose a secure data sharing scheme for dynamic members. We propose a secure way for key distribution without any secure communication channels, and the users can securely obtain their private keys from group manager.

## CONCLUSION

In this paper, we design a secure anti-collusion data sharing scheme for dynamic groups in the cloud. In our scheme, the users can securely obtain their private keys from group manager Certificate Authorities and secure communication channels. Also, our scheme is able to support dynamic groups efficiently, when a new user joins in the group or a
User is revoked from the group, the private keys of the other users do not need to be recomputed and updated. Moreover, our scheme can achieve secure user revocation; the revoked users can not be able to get the original data files once they are revoked even if they conspire with the untrusted cloud.

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