

MONA- Preserving Data Sharing and Identity Privacy for Dynamic Groups in the Cloud

**Mattela Sudheer Kumar**

**M.Tech Student,
Department of CSE,**

**Hyderabad Institute of Technology and Management,
JNTUH, Hyderabad.**

**Shafia Shaik, M.Tech**

**Associate Professor,
Department of CSE,**

**Hyderabad Institute of Technology and Management,
JNTUH, Hyderabad.**

Abstract:

Storing data on remote cloud storage makes the maintenance affordable by data owners. The reliability and trustworthiness of these remote storage locations is the main concern for data owners and cloud service providers. When multiple data owners are involved, the aspects of membership and data sharing need to be addressed. In this paper the author proposed efficient multi owner data sharing technique over cloud storage. The proposed scheme provides privacy and complexity while handling the data sharing over cloud. sharing data in a multi-owner manner while preserving data and identity privacy from an untrusted cloud is still a challenging issue, due to the frequent change of the membership. Meanwhile, the storage overhead and encryption computation cost our scheme are independent with the number of revoked users. In addition, we analyze the security of our scheme with rigorous proofs, and demonstrate the efficiency of our scheme in experiments. To resolve this problem recently the best efficient method MONA presented for secured multi owner data sharing in however we identified some limitations in that same approach in terms of reliability and scalability.

Keywords: Data Sharing, Cloud Computing, Access Control, User Revocation.

INTRODUCTION:

Cloud computing is one of the greatest platforms which provide storage of data in very lesser cost and available for all time over the internet Cloud computing is Internet-based computing, whereby shared resources, software and information are provided to computers and devices on demand.

In this several trends are opening up the era of Cloud Computing, which are an Internet-based development and use of computer technology. Cloud Computing means more than simply saving on Information Technology implementation costs. Cloud Computing offers enormous opportunity for new innovation, and even disruption of entire industries. So Cloud computing is the long dreamed vision of computing as a utility, where data owners can remotely store their data in the cloud to enjoy on-demand high-quality applications and services from a shared pool of configurable computing resources. Cloud Computing is recognized as an alternative to traditional Information Technology (IT) due to its intrinsic resource-sharing and low-maintenance characteristics. In this cloud computing, the cloud service providers (CSPs), such as Amazon, are able to deliver various services to cloud computing users with the help of powerful datacenters.

By migrating the local data management systems into cloud servers, users can enjoy high-quality services and save significant investments on their local infrastructures, and one of the most fundamental services offered by cloud providers is data storage. Let us consider a practical data application. A company allows its staffs in the same group or department to store and share files in the cloud. Specifically, the cloud servers managed by cloud providers are not fully trusted by users while the data files stored in the cloud may be sensitive and confidential, such as business plans. To preserve data privacy, a basic solution is to encrypting data files, and then uploads the encrypted data into the cloud. Unfortunately, designing an efficient and secure data sharing scheme for groups in the cloud is not an easy task due to the following challenging issues. Many privacy techniques for data sharing on remote storage machines have been recommended.

In these models, the data owners store the encrypted data on untreated remote storage. After that they will share the respective decryption keys with the authorized users. This prevent the cloud service providers and intruders to access the encrypted data, as they don't have the decrypting keys. However the new data owner registration in the above said models reveals the identity of the new data owner to the others in the group. The new data owner has to take permission from other data owners in the group before generating a decrypting key. The proposed system identified the problems during multi owner data sharing and proposed an efficient protocols and cryptographic techniques for solving drawbacks in the traditional approach. In this it proposed an efficient and novel secure key protocol for group key generation and using these key data owners can encrypt the all files. Suppose new user register into group the user need not to contact the data owner during the downloading of files and data can be encrypted with AES before uploading the data in to the cloud. we have seen many methods for secure data sharing in cloud computing, however most methods failed to achieve the efficient and as well as secure method for data sharing for groups. To provide the best solutions for the problems imposed by existing methods, recently the new method was presented called as MONA .

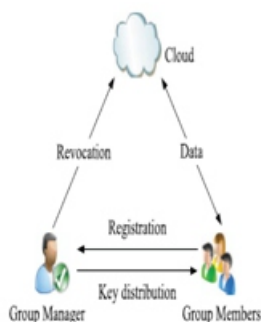


Fig. 1. System model.

This approach presents the design of secure data sharing scheme, Mona, for dynamic groups in an untrusted cloud. In MONA, a user is able to share data with others in the group without revealing the identity privacy to the cloud. Then additionally, MONA supports efficient user revocation and new user joining methods. More specially, efficient user revocation can be achieved through a public revocation list without updating the private keys of the remaining users, and new users can directly decrypt files stored in the cloud before their participation. Moreover, the storage overhead and the encryption computation cost are constant. Therefore practically in all cases MONA outperforms the existing methods.

The goal of cloud computing is to apply traditional super-computing, or high-performance computing power, normally used by military and research facilities, to perform tens of trillions of computations per second, in consumer-oriented applications such as financial portfolios, to deliver personalized information, to provide data storage or to power large, immersive computer games. Cloud computing is recognized as an alternative to traditional information technology due to its intrinsic resource-sharing and low-maintenance characteristics. In cloud computing, the cloud service providers (CSPs), such as Amazon, are able to deliver various services to cloud users with the help of powerful datacenters. By migrating the local data management systems into cloud servers, users can enjoy high-quality services and save significant investments on their local infrastructures. One of the most fundamental services offered by cloud providers is data storage. Let us consider a practical data application.

A company allows its staffs in the same group or department to store and share files in the cloud. By utilizing the cloud, the staffs can be completely released from the troublesome local data storage and maintenance. However, it also poses a significant risk to the confidentiality of those stored files. Specifically, the cloud servers managed by cloud providers are not fully trusted by users while the data files stored in the cloud may be sensitive and confidential, such as business plans. To preserve data privacy, a basic solution is to encrypt data files, and then upload the encrypted data into the cloud. Unfortunately, designing an efficient and secure data sharing scheme for groups in the cloud is not an easy task due to the following challenging issues.

First, identity privacy is one of the most significant obstacles for the wide deployment of cloud computing. Without the guarantee of identity privacy, users may be unwilling to join in cloud computing systems because their real identities could be easily disclosed to cloud providers and attackers. On the other hand, unconditional identity privacy may incur the abuse of privacy. For example, a misbehaved staff can deceive others in the company by sharing false files without being traceable. Therefore, traceability, which enables the group manager (e.g., a company manager) to reveal the real identity of a user, is also highly desirable. Second, it is highly recommended that any member in a group should be able to fully enjoy the data storing and sharing services provided by the cloud, which is defined as the multiple-owner manner.

Compared with the single-owner manner, where only the group manager can store and modify data in the cloud, the multiple-owner manner is more flexible in practical applications. More concretely, each user in the group is able to not only read data, but also modify his/her part of data in the entire data file shared by the company. Last but not least, groups are normally dynamic in practice, e.g., new staff participation and current employee revocation in a company. The changes of membership make secure data sharing extremely difficult. On one hand, the anonymous system challenges new granted users to learn the content of data files stored before their participation, because it is impossible for new granted users to contact with anonymous data owners, and obtain the corresponding decryption keys. On the other hand, an efficient membership revocation mechanism without updating the secret keys of the remaining users is also desired to minimize the complexity of key management.

Several security schemes for data sharing on untrusted servers have been proposed. In these approaches, data owners store the encrypted data files in untrusted storage and distribute the corresponding decryption keys only to authorized users. Thus, unauthorized users as well as storage servers cannot learn the content of the data files because they have no knowledge of the decryption keys. However, the complexities of user participation and revocation in these schemes are linearly increasing with the number of data owners and the number of revoked users, respectively. By setting a group with a single attribute, Lu et al. Proposed a secure provenance scheme based on the cipher text-policy attribute-based encryption technique, which allows any member in a group to share data with others.

The main contributions are:

- A secure multi-owner data sharing scheme. It implies that any user in the group can securely share data with others by the untrusted cloud is proposed.
- It is able to support dynamic groups efficiently. Specifically, new granted users can directly decrypt data files uploaded before their participation without contacting with data owners. User revocation can be easily achieved through a novel revocation list without updating the secret keys of the remaining users. The size and computation overhead of encryption are constant and independent with the number of revoked users.

- To provide secure and privacy-preserving access control to users, which guarantees any member in a group to anonymously utilize the cloud resource. Moreover, the real identities of data owners can be revealed by the group manager when disputes occur.

- A rigorous security analysis, and perform extensive simulations to demonstrate the efficiency of our scheme in terms of storage and computation overhead is provided.

RELATED WORK:

1) Plutus: Scalable Secure File Sharing on Untrusted Storage:

Plutus is a cryptographic storage system that enables secure file sharing without placing much trust on the file servers. In particular, it makes novel use of cryptographic primitives to protect and share files. Plutus features highly scalable key management while allowing individual users to retain direct control over who gets access to their files. We explain the mechanisms in Plutus to reduce the number of cryptographic keys exchanged between users by using filegroups, distinguish file read and write access, handle user revocation efficiently, and allow an untrusted server to authorize file writes. We have built a prototype of Plutus on OpenAFS. Measurements of this prototype show that Plutus achieves strong security with overhead comparable to systems that encrypt all network traffic.

2) Sirius: Securing Remote Untrusted Storage:

This paper presents SiRiUS, a secure file system designed to be layered over insecure network and P2P file systems such as NFS, CIFS, OceanStore, and Yahoo! Briefcase. SiRiUS assumes the network storage is untrusted and provides its own read-write cryptographic access control for file level sharing. Key management and revocation is simple with minimal out-of-band communication. File system freshness guarantees are supported by SiRiUS using hash tree constructions. SiRiUS contains a novel method of performing file random access in a cryptographic file system without the use of a block server. Extensions to SiRiUS include large scale group sharing using the NNL key revocation construction. Our implementation of SiRiUS performs well relative to the underlying file system despite using cryptographic operations.

3) Improved Proxy Re-Encryption Schemes with Applications to Secure Distributed Storage:

In 1998, Blaze, Bleumer, and Strauss (BBS) proposed an application called atomic proxy re-encryption, in which a semitrusted proxy converts a ciphertext for Alice into a ciphertext for Bob without seeing the underlying plaintext. We predict that fast and secure re-encryption will become increasingly popular as a method for managing encrypted file systems. Although efficiently computable, the wide-spread adoption of BBS re-encryption has been hindered by considerable security risks. Following recent work of Dodis and Ivan, we present new re-encryption schemes that realize a stronger notion of security and demonstrate the usefulness of proxy re-encryption as a method of adding access control to a secure file system. Performance measurements of our experimental file system demonstrate that proxy re-encryption can work effectively in practice.

4) Secure Provenance: The Essential of Bread and Butter of Data Forensics in Cloud Computing:

Secure provenance that records ownership and process history of data objects is vital to the success of data forensics in cloud computing, yet it is still a challenging issue today. In this paper, to tackle this unexplored area in cloud computing, we proposed a new secure provenance scheme based on the bilinear pairing techniques. As the essential bread and butter of data forensics and post investigation in cloud computing, the proposed scheme is characterized by providing the information confidentiality on sensitive documents stored in cloud, anonymous authentication on user access, and provenance tracking on disputed documents. With the provable security techniques, we formally demonstrate the proposed scheme is secure in the standard model.

5) Ciphertext-Policy Attribute-Based Encryption: An Expressive, Efficient, and Provably Secure Realization:

We present a new methodology for realizing Ciphertext-Policy Attribute Encryption (CP-ABE) under concrete and noninteractive cryptographic assumptions in the standard model.

Our solutions allow any encryptor to specify access control in terms of any access formula over the attributes in the system. In our most efficient system, ciphertext size, encryption, and decryption time scales linearly with the complexity of the access formula. The only previous work to achieve these parameters was limited to a proof in the generic group model. We present three constructions within our framework. Our first system is proven selectively secure under a assumption that we call the decisional Parallel Bilinear Diffie-Hellman Exponent (PB-DHE) assumption which can be viewed as a generalization of the BDHE assumption. Our next two constructions provide performance tradeoffs to achieve provable security respectively under the (weaker) decisional Bilinear-Diffie-Hellman Exponent and decisional Bilinear Diffie-Hellman assumptions.

PROBLEM STATEMENT:

To preserve data privacy, a basic solution is to encrypt data files, and then upload the encrypted data into the cloud. Unfortunately, designing an efficient and secure data sharing scheme for groups in the cloud is not an easy task. Data owners store the encrypted data files in untrusted storage and distribute the corresponding decryption keys only to authorized users. Thus, unauthorized users as well as storage servers cannot learn the content of the data files because they have no knowledge of the decryption keys. However, the complexities of user participation and revocation in these schemes are linearly increasing with the number of data owners and the number of revoked users, respectively.

Drawback:

- » identity privacy is one of the most significant obstacles for the wide deployment of cloud computing. Without the guarantee of identity privacy, users may be unwilling to join in cloud computing systems because their real identities could be easily disclosed to cloud providers and attackers. On the other hand, unconditional identity privacy may incur the abuse of privacy. For example, a misbehaved staff can deceive others in the company by sharing false files without being traceable.
- » Only the group manager can store and modify data in the cloud
- » The changes of membership make secure data sharing extremely difficult the issue of user revocation is not addressed.

PROBLEM DEFINITION:

1. We propose a secure multi-owner data sharing scheme. It implies that any user in the group can securely share data with others by the untrusted cloud.
2. Our proposed scheme is able to support dynamic groups efficiently. Specifically, new granted users can directly decrypt data files uploaded before their participation without contacting with data owners. User revocation can be easily achieved through a novel revocation list without updating the secret keys of the remaining users. The size and computation overhead of encryption are constant and independent with the number of revoked users.
3. We provide secure and privacy-preserving access control to users, which guarantees any member in a group to anonymously utilize the cloud resource. Moreover, the real identities of data owners can be revealed by the group manager when disputes occur.
4. We provide rigorous security analysis, and perform extensive simulations to demonstrate the efficiency of our scheme in terms of storage and computation overhead.

Advantages:

- » Any user in the group can store and share data files with others by the cloud.
- » The encryption complexity and size of cipher texts are independent with the number of revoked users in the system.
- » User revocation can be achieved without updating the private keys of the remaining users.
- » A new user can directly decrypt the files stored in the cloud before his participation.

IMPLEMENTATION:

1.Cloud Module:

we create a local Cloud and provide priced abundant storage services. The users can upload their data in the cloud. We develop this module, where the cloud storage can be made secure. However, the cloud is not fully trusted by users since the CSPs are very likely to be outside of the cloud users' trusted domain. Similar to we assume that the cloud server is honest but curious. That is, the cloud server will not maliciously delete or modify user data due to the protection of data auditing schemes, but will try to learn the content of the stored data and the identities of cloud users.

2.Group Manager:

Group manager takes charge of followings,

- a.System parameters generation,
- b.User registration,
- c.User revocation, and
- d.Revealing the real identity of a dispute data owner.

Therefore, we assume that the group manager is fully trusted by the other parties. The Group manager is the admin. The group manager has the logs of each and every process in the cloud. The group manager is responsible for user registration and also user revocation too.

3.Group Member:

Group members are a set of registered users that will

- a.store their private data into the cloud server and
- b.Share them with others in the group.

Note that, the group membership is dynamically changed, due to the staff resignation and new employee participation in the company. The group member has the ownership of changing the files in the group. Whoever in the group can view the files which are uploaded in their group and also modify it. The group meme

4.File Security:

- a.Encrypting the data file.
- b.File stored in the cloud can be deleted by either the group manager or the data owner.(i.e., the member who uploaded the file into the server).

5.Group Signature:

A group signature scheme allows any member of the group to sign messages while keeping the identity secret from verifiers. Besides, the designated group manager can reveal the identity of the signature's originator when a dispute occurs, which is denoted as traceability.

6. User Revocation:

User revocation is performed by the group manager via a public available revocation list (RL), based on which group members can encrypt their data files and ensure the confidentiality against the revoked users.

CONCLUSION:

In this paper, we propose a secure data sharing scheme, for dynamic groups in an untreated cloud. A user is able to share data with others in the group without revealing identity privacy to the cloud. and additionally, Its supports efficient user revocation and new user joining. More specially, efficient user revocation can be achieved through a public revocation list without updating the private keys of the remaining users, and new users can directly decrypt files stored in the cloud before their participation. However, assuring and enhancing security and privacy practices will attract more enterprises to world of the cloud computing In Thus to achieve the reliable and scalable MONA approach; in this paper we are presenting the new framework for MONA called as Reliable and Scalable MONA. Moreover, the storage overhead and the encryption computation cost are constant. Extensive analyses show that our proposed scheme satisfies the desired security requirements and guarantees efficiency as fine.

FUTURE ENHANCEMENT:

Our project has been developed in a very short period of time and all the efforts have been taken so that this project is very efficient in its execution. Although, there still exists scope for the improvement of our project in the future. Our project has been developed mainly by taking the example of the environment of the company. We can extend our project to the fields such as education, entertainment, various social networks and other wider areas. For example, we can employ our project in the universities to maintain the data base of the students which can be used by the groups of lecturers. Here lecturer becomes the group member and the head of the department becomes the group manager. Further enhancement in the security of the data uploaded by the members can be done. We can also concentrate on creating sub groups in the groups. We can concentrate on preserving identity privacy for its enhancement. Interaction between the group manager and the group member should be improved.

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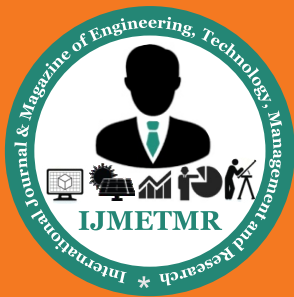
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