# A NOVEL APPROACH FOR DATA SHARING SCHEME IN CLOUD COMPUTING WITH ATTRIBUTE BASED ENCRYPTION (ABE)

**Mrs. ADDANKI KAVITHA**, Assistant Professor, Department of Computer Science, P. B. Siddhartha College of Arts and Science, Vijayawada, Andhra Pradesh.

**K. CHANDRA MOULI,** Assistant Professor, Dept. of MCA, NRI INSTITUTE OF TECHNOLOGY, A.P., India.

***Abstract*** — In this paper, we propose a lightweight data sharing scheme (LDSS) for mobile cloud computing. It adopts CP-ABE, an access control technology used in normal cloud environment, but changes the structure of access control tree to make it suitable for mobile cloud environments. LDSS moves a large portion of the computational intensive access control tree transformation in CP-ABE from mobile devices to external proxy servers. Furthermore, to reduce the user revocation cost, it introduces attribute description fields to implement lazy-revocation, which is a thorny issue in program based CP-ABE systems. The experimental results show that LDSS can effectively reduce the overhead on the mobile device side when users are sharing data in mobile cloud environments.

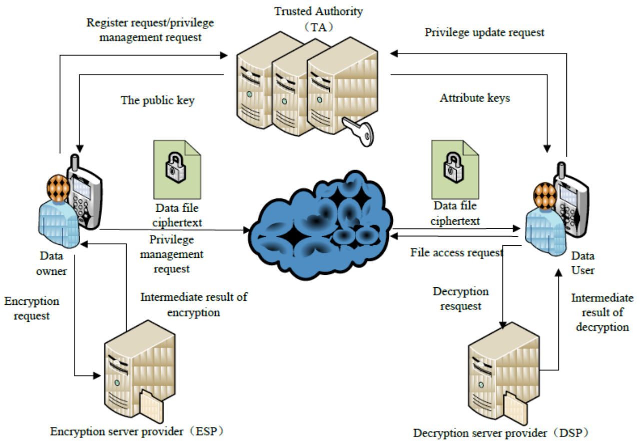
*Keywords* — Encryption, Access Control, User Revocation.

## 1. INTRODUCTION

Cloud mobile applications have been widely used. In these applications, people (data owners) can upload their photos, videos, documents and other files to the cloud and share these data with other people (data users) they like to share. To improve the cloud security. However, most of them are not applicable for mobile cloud since mobile devices only have limited computing resources and power. Solutions with low computational overhead are in great need for mobile cloud applications. Nowadays, to solve the above problems, personal sensitive data should be encrypted before uploaded onto the cloud so that the data is secure against the CSP. CSPs also provide data management functionality for data owners. Since personal data files are sensitive, data owners are allowed to choose whether to make their data files public or can only be shared with specific data users. Clearly, data privacy of the personal sensitive data is a big concern for many data owners. The state-of-the-art privilege management/access control mechanisms provided by the CSP are either not sufficient or not very convenient. They cannot meet all the requirements of data owners. First, when people upload their data files onto the cloud, they are leaving the data in a place where is out of their control, and the CSP may spy on user data for its commercial interests and/or other reasons. Second, people have to send password to each data user if they only want to share the encrypted data with certain users, which is very cumbersome. To simplify the privilege management, the data owner can

DOI : 10.36893.DRSR.2021.V08I14.107-111

divide data users into different groups and send password to the groups which they want to share the data. However, this approach requires finegrained access control. In both cases, password management is a big issue. We use proxy servers for encryption and decryption operations.in our approach, computational intensive operations in ABE are conducted on proxy servers, which greatly reduce the computational overhead on client side mobile devices. Meanwhile, in LDSS-CP-ABE, in order to maintain data privacy, version attribute is also needed to maintain data privacy, version attribute is also added to access structure. The decryption key format is modified so that it can be sent to the proxy servers in a secure way.


Trusted Authority
（TA）
Register request/privilege management request
Privilege update request
The public key
Attribute keys
Data file ciphertext
Data file ciphertext
Privilege management request
File access request
Data owner
Data User
Encryption request
Intermediate result of encryption
Decryption resquest
Intermediate result of decryption
Encryption server provider（ESP）
Decryption server provider（DSP）

## 2. LITURATURE SURVEY

### Attribute based proxy re-encryption with delegating capabilities.

**AUTHORS:** Liang Xiaohui, Cao Zhenfu, Lin Huang

Attribute based proxy re-encryption scheme (ABPRE) is a new cryptographic primitive which extends the traditional proxy re-encryption (public key or identity based cryptosystem) to the attribute based counterpart, and thus empower users with delegating capability in the access control environment. Users, identified by attributes, could freely designate a proxy who can re-encrypt a ciphertext related with a certain access policy to another one with a different access policy. The proposed scheme is proved selective-structure chosen plaintext secure and master key secure without random oracles. Besides, we develop another kind of key delegating capability in our scheme and also discuss some related issues including a stronger security model and applications.

### Attribute based proxy re-encryption with delegating capabilities

**AUTHORS:** Liang Xiaohui, Cao Zhenfu, Lin Huang

Attribute based proxy re-encryption scheme (ABPRE) is a new cryptographic primitive which extends the traditional proxy re-encryption (public key or identity based cryptosystem) to the attribute based counterpart, and thus empower users with delegating capability in the access control environment. Users, identified by attributes, could freely designate a proxy who can re-encrypt a ciphertext related with a certain access policy to another one with a different access policy. The proposed scheme is proved selective-structure chosen plaintext secure and master key secure without random oracles. Besides, we develop another kind of key delegating capability in our scheme and also discuss some related issues including a stronger security model and applications.

**Attribute-based fine-grained access control with efficient revocation in cloud storage systems**

**AUTHORS:** Kan Yang, Xiaohua Jia, Kui Ren

A cloud storage service allows data owner to outsource their data to the cloud and through which provide the data access to the users. Because the cloud server and the data owner are not in the same trust domain, the semi-trusted cloud server cannot be relied to enforce the access policy. To address this challenge, traditional methods usually require the data owner to encrypt the data and deliver decryption keys to authorized users. These methods, however, normally involve complicated key management and high overhead on data owner. In this paper, we design an access control framework for cloud storage systems that achieves fine-grained access control based on an adapted Ciphertext-Policy Attribute-based Encryption (CP-ABE) approach. In the proposed scheme, an efficient attribute revocation method is proposed to cope with the dynamic changes of users' access privileges in large-scale systems. The analysis shows that the proposed access control scheme is provably secure in the random oracle model and efficient to be applied into practice.

## 3. PROPOSED METHOD

Apparently, to solve the above problems, personal sensitive data should be encrypted before uploaded onto the cloud so that the data is secure against the CSP. However, the data encryption brings new problems. How to provide efficient access control mechanism on cipher text decryption so that only the authorized users can access the plaintext data is challenging. In addition, system must offer data owners effective user privilege management capability, so they can grant/revoke data access privileges easily on the data users. There have been substantial researches on the issue of data access control over cipher text. In these researches, they have the following common assumptions. First, the CSP is considered honest and curious. Second, all the sensitive data are encrypted before uploaded to the Cloud. Third, user authorization on certain data is achieved through encryption/decryption key distribution. In general, we can divide these approaches into four categories: simple cipher text access control, hierarchical access control, access control based on fully homomorphic encryption and access control based on attribute-based encryption (ABE). All these proposals are designed for non-mobile cloud environment.

## 4. RELATED WORK

### 1. Text Encryption and Decryption

In this module user encrypted the plain text  to encrypted format and uploaded to the cloud. The encryption is done by using a password. Only using this password only any one can decrypt the text. The user upload the password also include with encrypted data. The trusted authority id responsible for passing the password to the requested user

### 2. Image Encryption and decryption

Like the same as the image encryption is also done. And the encrypted images and password will also be uploaded to the cloud. The trusted authority id responsible for passing the password to the requested user

### 3. Text request

Any user can view the file uploaded in the server. All the files are in encrypted format. User cant view the files without know the password. For view the file first user need to request the password to Trusted Authority The Authority check the user and provide the password for valid user.

### 4. Image request

Image request is also same as the Text Request. The list of images can view in the application. But user can only view the images after getting the password from trusted authority

### 5. View Encrypted Data

The user uploaded encrypted data can be view in the server side. The trusted authority act as server they have the responsibility to provide password for the requested user.

### 6. View user request

After user view the encrypted data they can request the password for encrypted data. This user request can be view in the Trusted authority

### 7. Provide password

After view the request Trusted authority validating the user and if the user is valid the Trusted authority provide password for the requested file via email. Using this password user can decrypt the file

## CONCLUSION

In recent years, many studies on access control in cloud are based on attribute-based encryption algorithm (ABE). However, traditional ABE is not suitable for mobile cloud because it is

DOI : 10.36893.DRSR.2021.V08I14.107-111

computationally intensive and mobile devices only have limited resources. In this paper, we propose LDSS to address this issue. It introduces a novel LDSS-CP-ABE algorithm to migrate major computation overhead from mobile devices onto proxy servers, thus it can solve the secure data sharing problem in mobile cloud. The experimental results show that LDSS can ensure data privacy in mobile cloud and reduce the overhead on users' side in mobile cloud. In the future work, we will design new approaches to ensure data integrity.

To further tap the potential of mobile cloud, we will also study how to do cipher text retrieval over existing data sharing schemes.

## REFERENCES

[1] Gentry C, Halevi S. Implementing gentry's fully-homomorphic encryption scheme. in: Advances in Cryptology–EUROCRYPT 2011. Berlin, Heidelberg: Springer press, pp. 129-148, 2011.

[2] Brakerski Z, Vaikuntanathan V. Efficient fully homomorphic encryption from (standard) LWE. in: Proceeding of IEEE Symposium on Foundations of Computer Science. California, USA: IEEE press, pp. 97-106, Oct. 2011.

[3] Qihua Wang, Hongxia Jin. "Data leakage mitigation for discertionary access control in collaboration clouds". the 16th ACM Symposium on Access Control Models and Technologies (SACMAT), pp.103-122, Jun. 2011.

[4] Adam Skillen and Mohammad Mannan. On Implementing Deniable Storage Encryption for Mobile Devices. the 20th Annual Network and Distributed System Security Symposium (NDSS), Feb. 2013.

[5] Wang W, Li Z, Owens R, et al. Secure and efficient access to outsourced data. in: Proceedings of the 2009 ACM workshop on Cloud computing security. Chicago, USA: ACM pp. 55-66, 2009.

[6] Maheshwari U, Vingralek R, Shapiro W. How to build a trusted database system on untrusted storage. in: Proceedings of the 4th conference on Symposium on Operating System Design & Implementation-Volume 4. USENIX Association, pp. 10-12, 2000.

[7] Kan Yang, Xiaohua Jia, Kui Ren: Attribute-based fine-grained access control with efficient revocation in cloud storage systems. ASIACCS 2013, pp. 523-528, 2013.

[8] Crampton J, Martin K, Wild P. On key assignment for hierarchical access control. in: Computer Security Foundations Workshop. IEEE press, pp. 14-111, 2006.

[9] Shi E, Bethencourt J, Chan T H H, et al. Multi-dimensional range query over encrypted data. in: Proceedings of Symposium on Security and Privacy (SP), IEEE press, 2007. 350- 364

[10] Cong Wang, Kui Ren, Shucheng Yu, and Karthik Mahendra Raje Urs. Achieving Usable and Privacy-assured Similarity Search over Outsourced Cloud Data. IEEE INFOCOM 2012, Orlando, Florida, March 25-30, 2012

[11] Yu S., Wang C., Ren K., Lou W. Achieving Secure, Scalable, and Fine-grained Data Access Control in Cloud Computing. INFOCOM 2010, pp. 534-542, 2010

[12] Kan Yang, Xiaohua Jia, Kui Ren, Bo Zhang, Ruitao Xie: DACMACS: Effective Data Access Control for Multiauthority Cloud Storage Systems. IEEE Transactions on Information Forensics and Security, Vol. 8, No. 11, pp.1790-1801, 2013.

[13] Stehlé D, Steinfeld R. Faster fully homomorphic encryption. in: Proceedings of 16th International Conference on the Theory and Application of Cryptology and Information Security. Singapore: Springer press, pp.377-394, 2010.

[14] Junzuo Lai, Robert H. Deng ,Yingjiu Li ,et al. Fully secure keypolicy attribute-based encryption with constant-size ciphertexts and fast decryption. In: Proceedings of the 9th ACM symposium on Information, Computer and Communications Security (ASIACCS), pp. 239-248, Jun. 2014.