ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 3, Issue 2, pp: (582-585), Month: April - June 2015, Available at: www.researchpublish.com

Single Key Based Multiple File Sharing In Cloud Storage

[1]Shilpashree P

[1]PG Student (CSE), Dept of CSE, P.E.S. College of Engineering, Mandya, India
An Autonomous Institution under Visvesvaraya Technological University, Belgaum

Abstract: **Data sharing is an important functionality in cloud storage. In this article, The authors show how to securely, efficiently and flexibly share data with others in cloud storage. This paper describes new public-key cryptosystems which produce constant-size cipher texts such that efficient delegation of decryption rights for any set of cipher texts are possible. The novelty is that one can aggregate any set of secret keys and make them as compact as a single key, but encompassing the power of all the keys being aggregated. In other words, the secret key holder can release a constant-size aggregate key for flexible choices of cipher text set in cloud storage, but the other encrypted files outside the set remain confidential. This compact aggregate key can be conveniently sent to others or be stored in a smart card with very limited secure storage. Here they provide formal security analysis of our schemes in the standard model. They also describe other application of our schemes. In particular, this scheme gives the first public-key patient-controlled encryption for flexible hierarchy, which was yet to be known.**

Keywords: **Data sharing, cloud storage, single key, flexible.**

I. INTRODUCTION

Cloud storage is gaining popularity recently. In enterprise settings, we see the rise in demand for data outsourcing, which assists in the strategic management of corporate data. It is also used as a core technology behind many online services for personal applications. Nowadays, it is easy to apply for free accounts for email, photo album, file sharing and/or remote access, with storage size more than 25GB (or a few dollars for more than 1TB). Together with the current wireless technology, users can access almost all of their files and emails by a mobile phone in any corner of the world.

The paper proposes a new public-key cryptosystems which produce constant-size cipher texts such that efficient delegation of decryption rights for any set of cipher texts are possible. The novelty is that one can aggregate any set of secret keys and make them as compact as a single key, but encompassing the power of all the keys being aggregated. In other words, the secret key holder can release a constant-size aggregate key for flexible choices of cipher text set in cloud storage, but the other encrypted files outside the set remain confidential.

II. PROBLEM DEFINITION

Problem: For decryption of the documents in the existing system there is need to provide decrypt keys as many as documents that are shared between 2 people. For example say they sharing 10files then there is need to provide 10secret key to decrypt those documents which requires more bandwidth.

Solution: By making use of key aggregate cryptosystem while sharing many documents, the documents decrypt keys will be aggregated into one key and tat key will be sent by the sender to the receiver and the receiver make use of that aggregated key to decrypt those documents. for example out of 100 files the sender is sending only 10 documents and those 10 documents key will be aggregated into one key and will be given to receiver. He make use of the aggregated key to download those 10documents which requires less bandwidth.

This paper describes new public-key cryptosystems which produce constant-size cipher texts such that efficient delegation of decryption rights for any set of cipher texts are possible. of decryption rights for any set of cipher texts are possible. The novelty is that one can aggregate any set of secret keys and make them as compact as a single key, but encompassing the power of all the keys being aggregated. In other words, the secret key holder can release a constant-size aggregate key for flexible choices of cipher text set in cloud storage, but the other encrypted files outside the set remain confidential. This compact aggregate key can be conveniently sent to others or be stored in a xml with very limited secure storage.

III. EXISTING SYSTEM

Cloud storage is gaining popularity recently. In enterprise settings, we see the rise in demand for data outsourcing, which assists in the strategic management of corporate data. It is also used as a core technology behind many online services for personal applications. Nowadays, it is easy to apply for free accounts for email, photo album, file sharing and/or remote access, with storage size more than 25GB (or a few dollars for more than 1TB). Together with the current wireless technology, users can access almost all of their files and emails by a mobile phone in any corner of the world.

Considering data privacy, a traditional way to ensure it is to rely on the server to enforce the access control after authentication (e.g., [1]), which means any unexpected privilege escalation will expose all data. In a shared-tenancy cloud computing environment, things become even worse. Data from different clients can be hosted on separate virtual machines (VMs) but reside on a single physical machine. Data in a target VM could be stolen by instantiating another VM co-resident with the target one [2]. Regarding availability of files, there are a series of cryptographic schemes which go as far as allowing a third-party auditor to check the availability of files on behalf of the data owner without leaking anything about the data [3], or without compromising the data owners anonymity [4]. Likewise, cloud users probably will not hold the strong belief that the cloud server is doing a good job in terms of confidentiality. A cryptographic solution, e.g.,[5] , with proven security relied on number-theoretic assumptions is more desirable, whenever the user is not perfectly happy with trusting the security of the VM or the honesty of the technical staff. These users are motivated to encrypt their data with their own keys before uploading them to the server.

Data sharing is an important functionality in cloud storage. For example, bloggers can let their friends view a subset of their private pictures; an enterprise may grant her employees access to a portion of sensitive data. The challenging problem is how to effectively share encrypted data. Of course users can download the encrypted data from the storage, decrypt them, then send them to others for sharing, but it loses the value of cloud storage. Users should be able to delegate 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 cloud storage is not trivial. Below we will take Dropbox as an example for illustration. 1 Assume that Alice puts all her private photos on Dropbox, and she does not want to expose her photos to everyone. Due to various data leakage possibility Alice cannot feel relieved by just relying on the privacy protection mechanisms provided by Dropbox, so she encrypts all the photos using her own keys before uploading. One day, Alice's friend, Bob, asks her to share the photos taken over all these years which Bob appeared in. Alice can then use the share function of Dropbox, but the problem now is how to delegate the decryption rights for these photos to Bob. A possible option Alice can choose is to securely send Bob the secret keys involved.

Naturally, there are two extreme ways for her under the traditional encryption paradigm: Alice encrypts all files with a single encryption key and gives Bob the corresponding secret key directly. Alice encrypts files with distinct keys and sends Bob the corresponding secret keys. Obviously, the first method is inadequate since all unchosen data may be also leaked to Bob. For the second method, there are practical concerns on efficiency. The number of such keys is as many as the number of the shared photos, say, a thousand. Transferring these secret keys inherently requires a secure channel, and storing these keys requires rather expensive secure storage. The costs and complexities involved generally increase with the number of the decryption keys to be shared. In short, it is very heavy and costly to do that.

Encryption keys also come with two flavors — symmetric key or asymmetric (public) key. Using symmetric encryption, when Alice wants the data to be originated from a third party, she has to give the encryptor her secret key; obviously, this is not always desirable. By contrast, the encryption key and decryption key are different in public-key encryption. The use of public-key encryption gives more flexibility for our applications.

For example, in enterprise settings, every employee can upload encrypted data on the cloud storage server without the knowledge of the company's master-secret key. taken over all these years which Bob appeared in. Alice can then use the share function of Dropbox, but the problem now is how to delegate the decryption rights for these photos to Bob. A possible option Alice can choose is to securely send Bob the secret keys involved.

Naturally, there are two extreme ways for her under the traditional encryption paradigm:Alice encrypts all files with a single encryption key and gives Bob the corresponding secret key directly.Alice encrypts files with distinct keys and sends Bob the corresponding secret keys.

ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 3, Issue 2, pp: (582-585), Month: April - June 2015, Available at: www.researchpublish.com

Obviously, the first method is inadequate since all unchosen data may be also leaked to Bob. For the second method, there are practical concerns on efficiency. The number of such keys is as many as the number of the shared photos, say, a thousand. Transferring these secret keys inherently requires a secure channel, and storing these keys requires rather expensive secure storage. The costs and complexities involved generally increase with the number of the decryption keys to be shared. In short, it is very heavy and costly to do that.

Encryption keys also come with two flavors — symmetric key or asymmetric (public) key. Using symmetric encryption, when Alice wants the data to be originated from a third party, she has to give the encryptor her secret key; obviously, this is not always desirable. By contrast, the encryption key and decryption key are different in public-key encryption. The use of public-key encryption gives more flexibility for our applications. For example, in enterprise settings, every employee can upload encrypted data on the cloud storage server without the knowledge of the company's master-secret key.

IV. PROPOSED SYSTEM

In modern cryptography, a fundamental problem we often study is about leveraging the secrecy of a small piece of knowledge into the ability to perform cryptographic functions (e.g. encryption, authentication) multiple times. In this paper, we study how to make a decryption key more powerful in the sense that it allows decryption of multiple cipher texts, without increasing its size. Specifically, our problem statement is "To design an efficient public-key encryption scheme which supports flexible delegation in the sense that any subset of the cipher texts (produced by the encryption scheme) is decryptable by a constant-size decryption key (generated by the owner of the master-secret key)."

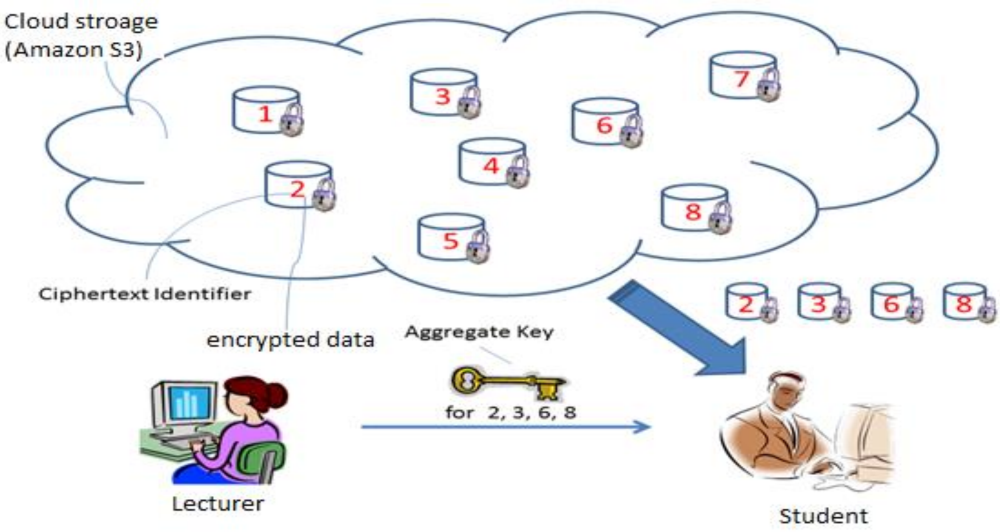

Fig.6 Lecturer shares files with identifiers 2, 3, 6 and 8 with student by sending him a single aggregate key.

This paper solves this problem by introducing a special type of public-key encryption. In this encryption scheme, users encrypt a message not only under a public-key, but also under an identifier of ciphertext called class. That means the ciphertexts are further categorized into different classes. The key owner holds a master-secret called master-secret key, which can be used to extract secret keys for different classes. More importantly, the extracted key have can be an aggregate key which is as compact as a secret key for a single class, but aggregates the power of many such keys, i.e., the decryption power for any subset of ciphertext classes.

With this solution, lecturer can simply send students a single aggregate key via a secure TCP/IP connection. Student can download the encrypted photos from lecturer's Amazon S3 space and then use this aggregate key to decrypt these encrypted photos. The scenario is depicted in above figure

The sizes of ciphertext, public-key, master-secret key and aggregate key in our schemes are all of constant size. The public system parameter has size linear in the number of ciphertext classes, but only a small part of it is needed each time and it can be fetched on demand from large (but non-confidential) cloud storage. Previous results may achieve a similar property featuring a constant-size decryption key, but the classes need to conform to some pre-defined hierarchical relationship. This work is flexible in the sense that this constraint is eliminated, that is, no special relation is required between the classes.

This paper propose several public key cryptosystem schemes with different security levels and extensions in this article. All constructions can be proven secure in the standard model.

V. EXPECTED OUTPUT

This paper gives secure, efficient, and flexible way of sharing the data with others in cloud storage by describing new public-key cryptosystems which produce constant-size ciphertexts such that efficient delegation of decryption rights for any set of cipher texts are possible. One can aggregate any set of secret keys and make them as compact as a single key, but encompassing the power of all the keys being aggregated. In other words, the secret key holder can release a constant-size aggregate key for flexible choices of ciphertext set in cloud storage, but the other encrypted files outside the set remain confidential.

VI. CONCLUSION

How to protect users' data privacy is a central question of cloud storage. With more mathematical tools, cryptographic schemes are getting more versatile and often involve multiple keys for a single application. In this article, we consider how to "compress" secret keys in public-key cryptosystems which support delegation of secret keys for different ciphertext 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. This approach is more flexible than hierarchical key assignment which can only save spaces if all key-holders share a similar set of privileges.

REFERENCES

[1] S. S. M. Chow, Y. J. He, L. C. K. Hui, and S.-M. Yiu, "SPICE -Simple Privacy-Preserving Identity-Management for Cloud Environment,"in Applied Cryptography and Network Security – ACNS 2012, ser. LNCS, vol. 7341. Springer, 2012, pp. 526–543.

[2] L. Hardesty, "Secure computers aren't so secure," MIT press, 2009, http://www.physorg.com/news176107396.html.

[3] C. Wang, S. S. M. Chow, Q. Wang, K. Ren, and W. Lou, "Privacy-Preserving Public Auditing for Secure Cloud Storage," IEEE Trans.Computers, vol. 62, no. 2, pp. 362–375, 2013.

[4] B. Wang, S. S. M. Chow, M. Li, and H. Li, "Storing Shared Data on the Cloud via Security-Mediator," in International Conference on Distributed Computing Systems - ICDCS 2013. IEEE, 2013.

[5] S. S. M. Chow, C.-K. Chu, X. Huang, J. Zhou, and R. H. Deng, "Dynamic Secure Cloud Storage with Provenance," in Cryptography and Security: From Theory to Applications - Essays Dedicated to Jean-Jacques Quisquater on the Occasion of His 65th Birthday, ser. LNCS, vol. 6805. Springer, 2012, pp. 442–464.

[6] D. Boneh, C. Gentry, B. Lynn, and H. Shacham, "Aggregate and Verifiably Encrypted Signatures from Bilinear Maps," in Proceedings of Advances in Cryptology - EUROCRYPT '03, ser. LNCS,vol. 2656. Springer, 2003, pp. 416–432.

[7] M. J. Atallah, M. Blanton, N. Fazio, and K. B. Frikken, "Dynamic and Efficient Key Management for Access Hierarchies," ACM Transactions on Information and System Security (TISSEC), vol. 12, no. 3, 2009.

[8] J. Benaloh, M. Chase, E. Horvitz, and K. Lauter, "Patient Controlled Encryption: Ensuring Privacy of Electronic Medical Records," in Proceedings of ACM Workshop on Cloud Computing Security (CCSW '09). ACM, 2009, pp. 103–114.

[9] F. Guo, Y. Mu, Z. Chen, and L. Xu, "Multi-Identity Single-Key Decryption without Random Oracles," in Proceedings of Information Security and Cryptology (Inscrypt '07), ser. LNCS, vol. 4990. Springer, 2007, pp. 384–398.

[10] V. Goyal, O. Pandey, A. Sahai, and B. Waters, "Attribute-Based

[11] Encryption for Fine-Grained Access Control of Encrypted data," in Proceedings of the 13th ACM Conference on Computer and Communications Security (CCS '06). ACM, 2006, pp. 89–98.