ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

Diffie-Hellman Key Exchange Based Multi-Authority Dynamic Data Sharing in Cloud

M.Manoj Kumar
M.Tech Student
Department of CSE
Prasad College of Engineering
Siddipet Rd, Jangaon, Telangana.

M.Srikanth
Associate Professor
Department of CSE
Prasad College of Engineering
Siddipet Rd, Jangaon, Telangana.

ABSTRACT:

Control access to data in the cloud is an efficient way to ensure data security. Due to unreliable data, an outsourcing and cloud server, data storage systems for access control to the cloud is a challenging problem. It is much more direct control over the policies that will give access to the data because the owners of the ciphertext-policy attribute-based encryption (KP-ABE), cloud storage is considered to be one of the technologies most suitable for data access control. However, because it is directly on the issue of the cancellation of the data access control for cloud storage systems are difficult to apply in the CP-ABE programs. In this paper, we co-exist with multiple power of cloud storage systems where multiple authorities, a program designed to control the expression and access to efficient and revocable data attributes that can be issued independently of each authority. In particular, we propose a revocable multiple power CP-ABE program, and to apply the techniques of the underlying design data access control scheme. Forward and backward safety and security of our property can be achieved by effectively canceling method. Access control, data analysis and simulation results of the proposed scheme, the random oracle model, our safe and have shown to be more effective than previous works.

I. INTRODUCTION:

Attribute based encryption (ABE) [13] determines decryption ability based on a user's attributes. In a multi-authority ABE scheme, multiple attribute-authorities monitor different sets of attributes and issue corresponding decryption keys to users and encryptors can require that a user obtain keys for appropriate attributes from each authority before decrypting a message. Chase [5] gave a multi-authority ABE scheme using the concepts of a trusted central authority (CA) and global identifiers (GID). However, the CA in that construction has the power to decrypt every ciphertext, which seems somehow contradictory to the original goal of distributing control over many potentially untrusted authorities. Moreover, in that construction, the use of a consistent GID allowed the authorities to combine their information to build a full profile with all of a user's attributes, which unnecessarily compromises the privacy of the user. In this paper, we propose a solution which removes the trusted central authority, and protects the users' privacy by preventing the authorities from pooling their information on particular users, thus making ABE more usable in practice. We propose a Multi-Authority Attribute-Based Encryption (ABE) system. In our system, any party can become an authority and there is no requirement for any global coordination other than the creation of an initial set of common reference parameters. A party can simply act as an ABE authority by creating a public key and issuing private keys to different users that reflect their attributes. A user can encrypt data in terms of any Boolean formula over attributes issued from any chosen set of authorities. Finally, our system does not require any central authority. In constructing our system, our largest technical hurdle is to make it collusion resistant. Prior Attribute-Based Encryption systems achieved collusion resistance when the ABE system authority "tied" together different components (representing different attributes) of a user's private key by randomizing the key. However, in our system each component will come from a potentially different authority, where we assume no coordination between such authorities. We create new techniques to tie key

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

components together and prevent collusion attacks between users with different global identifiers.We prove our system secure using the recent dual system encryption methodology where the security proof works by first converting the challenge ciphertext and private keys to a semi-functional form and then arguing security. We follow a recent variant of the dual system proof technique due to Lewko and Waters and build our system using bilinear groups of Composite order. We prove security under similar static assumptions to the LW paper in the random oracle model. Ciphertext-Policy Attribute Based Encryption (CP-ABE) is a promising cryptographic primitive for fine-grained access control of shared data. In CP-ABE, each user is associated with a set of attributes and data are encrypted with access structures on attributes. A user is able to decrypt a ciphertext if and only if his attributes satisfy the ciphertext access structure. Beside this basic property, practical applications usually have other requirements. In this paper we focus on an important issue of attribute revocation which is cumbersome for CP-ABE schemes. In particular, we resolve this challenging issue by considering more practical scenarios in which semi-trustable on-line proxy servers are available. As compared to existing schemes, our proposed solution enables the authority to revoke user attributes with minimal effort. We achieve this by uniquely integrating the technique of proxy re-encryption with CP-ABE, and enable the authority to delegate most of laborious tasks to proxy servers. Formal analysis shows that our proposed scheme is provably secure against chosen ciphertext attacks. In addition, we show that our technique can also be applicable to the Key-Policy Attribute Based Encryption (KP-ABE) counterpart.

II. RELATED WORK

Personal health record (PHR) is an emerging patient-centric model of health information exchange, which is often outsourced to be stored at a third party, such as cloud providers. However, there have been wide privacy concerns as personal health information could be exposed to those third party servers and to unauthorized parties. To assure the patients' control over access to their own PHRs, it is a promising method to encrypt the PHRs before outsourcing. Yet, issues such as risks of privacy exposure, scalability in key management, flexible access and efficient user revocation, have remained the most important challenges toward achieving fine-grained, cryptographically enforced data access control. In this paper, we propose a novel patient-centric framework and a suite of mechanisms for data access control to PHRs stored in semi-trusted servers. To achieve fine-grained and scalable data access control for PHRs, we leverage attribute based encryption (ABE) techniques to encrypt each patient's PHR file. Different from previous works in secure data outsourcing, we focus on the multiple data owner scenario, and divide the users in the PHR system into multiple security domains that greatly reduces the key management complexity for owners and users. A high degree of patient privacy is guaranteed simultaneously by exploiting multi-authority ABE. Our scheme also enables dynamic modification of access policies or file attributes, supports efficient on-demand user/attribute revocation and break-glass access under emergency scenarios. Extensive analytical and experimental results are presented which show the security, scalability and efficiency of our proposed scheme.

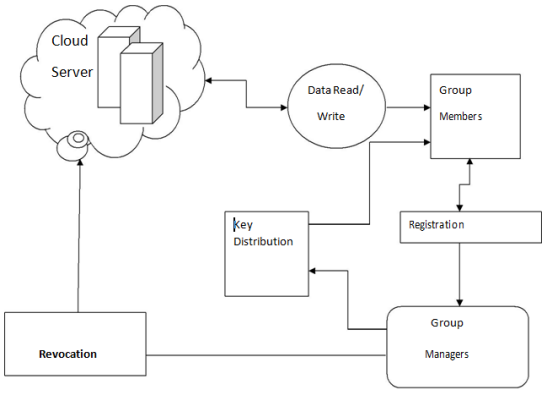

FIG 1: SYSTE, ARCHITECTURE:

III. SYSTEM PREMELIRIES:

This new paradigm of data hosting and data access services introduces a great challenge to data access control. Because the cloud server cannot be fully trusted by data owners, they can no longer rely on servers to do access control. Ciphertext-Policy Attribute-based Encryption (CP-ABE) is regarded as one of the most suitable technologies for data access control in cloud

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

storage systems ,because it gives the data owner more direct control on access policies. In CP-ABE scheme, there is an authority that is responsible for attribute management and key distribution. An identity based encryption scheme, each user is identified by a unique identity string. An attribute based encryption scheme (ABE), in contrast, is a scheme in which each user is identified by a set of attributes, and some function of those attributes is used to determine decryption ability for each ciphertext. Sahai and Waters introduced a single authority attribute encryption scheme and left open the question of whether a scheme could be constructed in which multiple authorities were allowed to distribute attributes [SW05]. We answer this question in the affirmative. Our scheme allows any polynomial number of independent authorities to monitor attributes and distribute secret keys. An encryptor can choose, for each authority, a number dk and a set of attributes; he can then encrypt a message such that a user can only decrypt if he has at least dk of the given attributes from each authority k. Our scheme can tolerate an arbitrary number of corrupt authorities. We also show how to apply our techniques to achieve a multi authority version of the large universe fine grained access control ABE presented by Gopal et al. we first propose a revocable multiauthority CP-ABE scheme, where an efficient and secure revocation method is proposed to solve the attribute revocation problem in the system. Our attribute revocation method is efficient in the sense that it incurs less communication cost and computation cost, and is secure in the sense that it can achieve both backward security (The revoked user cannot decrypt any new ciphertext that requires the revoked attribute to decrypt)and forward security (The newly joined user can also decrypt the previously published ciphertexts1, if it has sufficient.attributes). Our scheme does not require the server to be fully trusted, because the key update is enforced by each attribute authority not the server. Even if the server is not semitrusted in some scenarios, our scheme can still guarantee the backward security. Then, we apply our proposed revocable multi-authority CP-ABE scheme as the underlying techniques to construct the expressive and secure data access control scheme for multi-authority cloud storage systems.

IV. CONCLUSION

In this paper, we proposed a revocable multi-authority CPABE scheme that can support efficient attribute revocation. Then, we constructed an effective data access control scheme for multi-authority cloud storage systems. We also proved that our scheme was provable secure in the random oracle model. The revocable multi-authority CPABE is a promising technique, which can be applied in any remote storage systems and online social networks etc.

REFERENCES

[1] P. Mell and T. Grance, ‘‘The NIST Definition of Cloud Computing,’’ National Institute of Standards and Technology, Gaithersburg, MD, USA, Tech. Rep., 2009.

[2] J. Bethencourt, A. Sahai, and B. Waters, ‘‘Ciphertext-Policy Attribute-Based Encryption,’’ in Proc. IEEE Symp. Security and privacy (S&P’07), 2007, pp. 321-334.

[3] B. Waters, ‘‘Ciphertext-Policy Attribute-Based Encryption: An Expressive, Efficient, and Provably Secure Realization,’’ in Proc. 4th Int’l Conf. Practice and Theory in Public Key Cryptography (PKC’11), 2011, pp. 53-70.

[4] V. Goyal, A. Jain,O. Pandey, andA. Sahai, ‘‘Bounded Ciphertext Policy Attribute Based Encryption,’’ in Proc. 35th Int’l Colloquium on Automata, Languages, and Programming (ICALP’08), 2008, pp. 579-591.

[5] A.B. Lewko, T. Okamoto, A. Sahai, K. Takashima, and B.Waters, ‘‘Fully Secure Functional Encryption: Attribute-Based Encryption and (Hierarchical) Inner Product Encryption,’’ in Proc. Advances in Cryptology-EUROCRYPT’10, 2010, pp. 62-91.

[6] M. Chase, ‘‘Multi-Authority Attribute Based Encryption,’’ in Proc. 4th Theory of Cryptography Conf. Theory of Cryptography (TCC’07), 2007, pp. 515-534.

[7] M. Chase and S.S.M. Chow, ‘‘Improving Privacy and Security in Multi-Authority Attribute-Based Encryption,’’ in Proc. 16th ACM Conf. Computer and Comm. Security (CCS’09), 2009, pp. 121-130.

[8] A.B. Lewko and B. Waters, ‘‘Decentralizing Attribute-Based Encryption,’’ in Proc. Advances in Cryptology-EUROCRYPT’11, 2011, pp. 568-588.

[9] S. Yu, C. Wang, K. Ren, and W. Lou, ‘‘Attribute Based Data Sharing with Attribute Revocation,’’ in Proc. 5th ACM Symp. Information, Computer and Comm. Security (ASIACCS’10), 2010, pp. 261-270.

[10] M. Li, S. Yu, Y. Zheng, K. Ren, andW. Lou, ‘‘Scalable and Secure Sharing of Personal Health Records in Cloud Computing Using Attribute-Based Encryption,’’ IEEE Trans. Parallel Distributed Systems, vol. 24, no. 1, pp. 131-143, Jan. 2013.

[11] J. Hur and D.K. Noh, ‘‘Attribute-Based Access Control with Efficient Revocation in Data Outsourcing Systems,’’ IEEE Trans. Parallel Distributed Systems, vol. 22, no. 7, pp. 1214-1221, July 2011.

[12] S. Jahid, P. Mittal, and N. Borisov, ‘‘Easier: Encryption-Based Access Control in Social Networks with Efficient Revocation,’’ in Proc. 6th ACM Symp. Information, Computer and Comm. Security (ASIACCS’11), 2011, pp. 411-415.

[13] S. Ruj, A. Nayak, and I. Stojmenovic, ‘‘DACC: Distributed Access Control in Clouds,’’ in Proc. 10th IEEE Int’l Conf. TrustCom, 2011, pp. 91-98.

[14] K. Yang and X. Jia, ‘‘Attribute-Based Access Control for Multi-Authority Systems in Cloud Storage,’’ in Proc. 32th IEEE Int’l Conf. Distributed Computing Systems (ICDCS’12), 2012, pp. 1-10.

[15] D. Boneh and M.K. Franklin, ‘‘Identity-Based Encryption from the Weil Pairing,’’ in Proc. 21st Ann. Int’l Cryptology Conf.: Advances in Cryptology - CRYPTO’01, 2001, pp. 213-229.