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Decentralized Network for Retrieval of Secret Information in Wireless Area Network

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Abstract: **- In this paper, our proposed system conveys a safe and secure information system with CP-ABE on the decentralized Network in which any number of authorized authorities can man access their own secret keys personally. Our results conveys the way to practice the suggested implementation strongly and effectively to address the secret facts disseminated in the disturbance of wireless area network. Many applications require increased protection of confidential data including access control methods that are cryptographically enforced.**

Key words**— Secret Information, CP - ABE, Decentralized network, cryptography.**

I. INTRODUCTION

In this network scenario, user has the wireless device and that device may be disconnected due to environmental factors. Disruption-tolerant network (DTN) technologies are becoming successful solutions that allow nodes to communicate with each other in these extreme networking environments. Typically, when there is no end-to-end connection between a source and a destination pair, the messages from the source node may need to wait in the intermediate nodes for a substantial amount of time until the connection would be eventually established. Roy and Chuah introduced storage nodes in DTNs where data is stored or replicated such that only authorized mobile nodes can access the necessary information quickly and efficiently. Many applications require increased protection of confidential data including access control methods that are cryptographically enforced. In many cases, it is desirable to provide differentiated access services such that data access policies are defined over user attributes or roles, which are managed by the key authorities. For example, an authorized user may store confidential information at a storage node, which should be accessed by members. In this case, it is a reasonable assumption that multiple key authorities are likely to manage their own dynamic attributes for other user in their deployed regions, which could be frequently changed. We refer to this DTN architecture where multiple authorities issue and manage their own attribute keys independently as a decentralized DTN. The concept of attribute-based encryption (ABE) is a promising approach that fulfills the requirements for secure data retrieval in DTNs. ABE features a mechanism that enables an access control over encrypted data using access policies and ascribed attributes among private keys and cipher texts. Especially, cipher text-policy ABE (CP-ABE) provides a scalable way of encrypting data such that the encryptor defines the attribute set that the decryptor needs to possess in order to decrypt the cipher text. Thus, different users are allowed to decrypt different pieces of data per the security policy. Another challenge is the key escrow problem. In CP-ABE, the key authority generates private keys of users by applying the authority’s master secret keys to users’ associated set of attributes. Thus, the key authority can decrypt every cipher text addressed to specific users by generating their attribute keys. If the key authority is compromised by adversaries when deployed in the hostile environments, this could be a potential threat to the data confidentiality or privacy especially when the data is highly sensitive. The key escrow is an inherent problem even in the multiple-authority systems as long as each key authority has the whole privilege to generate their own attribute keys with their own master secrets. Since such a key generation mechanism based on the single master secret is the basic method for most of the asymmetric encryption systems such as the attribute- based or identity-based encryption protocols, removing escrow in single or multiple-authority CP-ABE is a pivotal open problem. This is due to the fact that the different authorities generate their own attribute keys using their own independent and individual master secret keys. Therefore, general access policies, such as “-out-of-” logic, cannot be expressed in the previous schemes, which is a very practical and commonly required access policy logic.

II LITERATURE SURVEY

[1] ATTRIBUTE-BASED ENCRYPTION FOR FINE- GRAINED ACCESS CONTROL OF ENCRYPTED DATA

As more sensitive data is shared and stored by third-party sites on the Internet, there will be a need to encrypt data stored at these sites. One drawback of encrypting data, is that it can be selectively shared only at a coarse-grained level (i.e., giving another party your private key). We develop a new cryptosystem for ¯ne-grained sharing of encrypted data that we call Key-Policy Attribute-Based Encryption (KP-ABE). In our cryptosystem, cipher texts are labeled with sets of attributes and private keys are associated with access structures that control which cipher texts a user is able to decrypt. We demonstrate the applicability of our construction to sharing of audit-log information and broadcast encryption. Our construction supports delegation of private keys which subsumes Hierarchical Identity-Based Encryption (HIBE).

[2], DECENTRALIZING ATTRIBUTE-BASED ENCRYPTION

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 reect 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 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 cipher text 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.

[3] IDENTITY-BASED ENCRYPTION WITH EFFICIENT REVOCATION

Identity-based encryption (IBE) is an exciting alternative to public-key encryption, as IBE eliminates the need for a Public Key Infrastructure (PKI). Any setting, PKI- or identity-based, must provide a means to revoke users from the system. Efficient revocation is a well-studied problem in the traditional PKI setting. However in the setting of IBE, there has been little work on studying the revocation mechanisms. The most practical solution requires the senders to also use time periods when encrypting, and all the receivers (regardless of whether their keys have been compromised or not) to update their private keys regularly by contacting the trusted authority. We note that this solution does not scale well – as the number of users increases, the work on key updates becomes a bottleneck. We propose an IBE scheme that significantly improves key-update efficiency on the side of the trusted party (from linear to logarithmic in the number of users), while staying efficient for the users. Our scheme builds on the ideas of the Fuzzy IBE primitive and binary tree data structure, and is provably secure.

[4] MESSAGE FERRY ROUTE DESING FOR SPARSE AD HOC NETWORKS WITH MOBILE NODES

Message ferrying is a networking paradigm where a special node, called a message ferry, facilitates the connectivity in a mobile ad hoc network where the nodes are sparsely deployed. One of the key challenges under this paradigm is the design of ferry routes to achieve certain properties of end to-end connectivity, such as, delay and message loss among the nodes in the ad hoc network. This is a difficult problem when the nodes in the network move arbitrarily. As we cannot be certain of the location of the nodes, we cannot design a route where the ferry can con act the nodes with certainty. Due to this difficulty, prior work has either considered ferry route design for ad hoc networks where the nodes are stationary, or where the nodes and the ferry move pro-actively in order to meet at certain locations. Such systems either require long-range radio or disrupt nodes' mobility patterns which can be dictated by non-communication tasks. We present a message ferry route design algorithm that we call the Optimized Way-points, or OPWP, that generates a ferry route which assures good performance without requiring any online collaboration between the nodes and the ferry. The OPWP ferry route comprises a set of way-points and waiting times at these way-points, that are chosen carefully based on the node mobility model. Each time that the ferry traverses this route, it contacts each mobile node with a certain minimum probability. The node-ferry contact probability in turn determines the frequency of node-ferry contacts and the properties of end-to-end delay. We show that OPWP consistently outperforms other naive ferry routing approaches.

III EXISTING SYSTEM

ABE comes in two flavors called key-policy ABE (KP-ABE) and cipher text-policy ABE (CP-ABE). In KP-ABE, the encryptor only gets to label a cipher text with a set of attributes. The key authority chooses a policy for each user that determines which cipher texts he can decrypt and issues the key to each user by embedding the policy into the user's key. However, the roles of the cipher texts and keys are reversed in CP-ABE. In CP-ABE, the cipher text is encrypted with an access policy chosen by an encryptor, but a key is simply created with respect to an attributes set. CP-ABE is more appropriate to DTNs than KP-ABE because it enables encryptors such as a commander to choose an access policy on attributes and to encrypt confidential data under the access structure via encrypting with the corresponding public keys or attributes.

DISADVANTAGES OF EXISTING SYSTEM:

The problem of applying the ABE to DTNs introduces several security and privacy challenges. Since some users may change their associated attributes at some point (for example, moving their region), or some private keys might be compromised, key revocation (or update) for each attribute is necessary in order to make systems secure. However, this issue is even more difficult, especially in ABE systems, since each attribute is conceivably shared by multiple users (henceforth, we refer to such a collection of users as an attribute group)

Another challenge is the key escrow problem. In CP-ABE, the key authority generates private keys of users by applying the authority's master secret keys to users' associated set of attributes. The last challenge is the coordination of attributes issued from different authorities. When multiple authorities manage and issue attributes keys to users independently with their own master secrets, it is very hard to define fine-grained access policies over attributes issued from different authorities.

IV PROPOSED SYSTEM

In this section, we provide a multi authority CP-ABE scheme for secure data retrieval in decentralized DTNs. Each local authority issues partial personalized and attribute key components to a user by performing secure 2PC protocol with the central authority. Each attribute key of a user can be updated individually and immediately. Thus, the scalability and security can be enhanced in the proposed scheme.

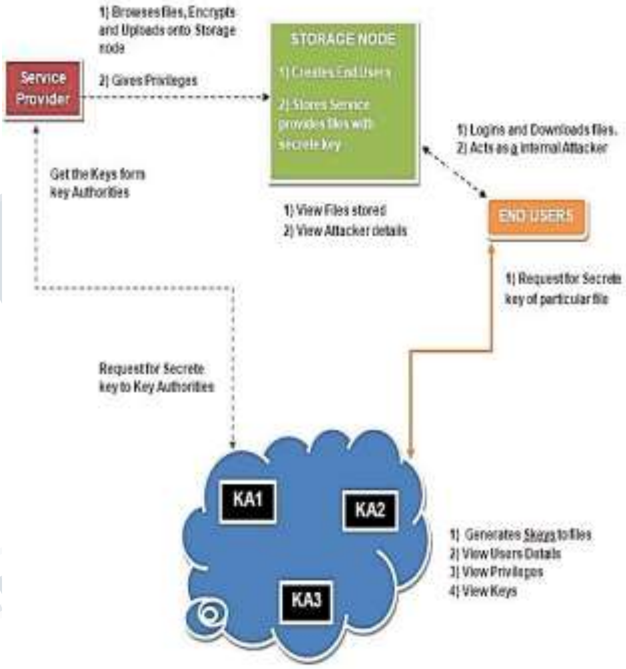

1) Browses files, Encrypts and Uploads onto Storage node
2) Gives Privileges
Service Provider
STORAGE NODE
1) Creates End Users
2) Stores Service provides files with secrete key
1) Logins and Downloads files.
2) Acts as a internal Attacker
Get the Keys form key Authorities
1) View Files stored
2) View Attacker details
END USERS
1) Request for Secrete key of particular file
Request for Secrete key to Key Authorities
KA1
KA2
KA3
1) Generates Skeys to files
2) View Users Details
3) View Privileges
4) View Keys

Fig: 4.1 Architecture of Proposed system

Since the first CP-ABE scheme proposed by Bethencourt et al , dozens of CP-ABE schemes have been proposed. The subsequent CP-ABE schemes are mostly motivated by more rigorous security proof in the standard model. However, most of the schemes failed to achieve the expressiveness of the Bethencourt et al.'s scheme, which described an efficient system that was expressive in that it allowed an encryptor to express an access predicate in terms of any monotonic formula over attributes. Therefore, in this section, we develop a variation of the CP-ABE algorithm partially based on (but not limited to) Bethencourt et al.'s construction in order to enhance the expressiveness of the access control policy instead of building a new CP-ABE scheme from scratch.

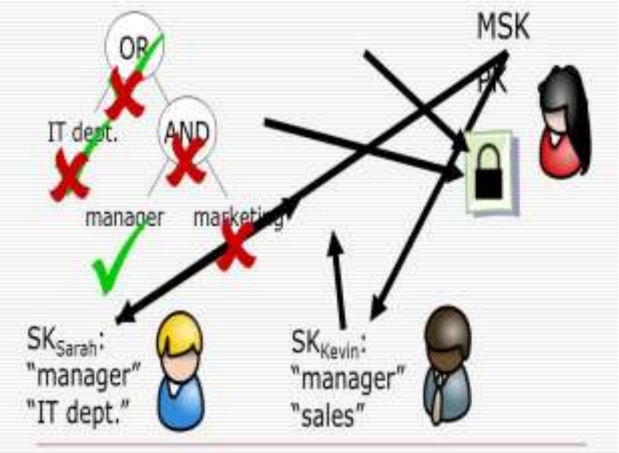


Fig: 4.2 CP – ABE for access control

Key Generation: The key issuing protocol generates and issues user secret keys by performing a secure two-party computation (2PC) protocol among the key authorities with their own master secrets. The 2PC protocol deters the key authorities from obtaining any master secret information of each other such that none of them could generate the whole set of user keys alone. Thus, users are not required to fully trust the authorities in order to protect their data to be shared. The data confidentiality and privacy can be cryptographically enforced against any curious key authorities or data storage nodes in the proposed scheme. It is easy to retrieve user profile information of communication in networking system Key Update: When a user comes to hold or drop an attribute, the corresponding key should be updated to prevent the user from accessing the previous or subsequent encrypted data for backward or forward secrecy, respectively. The key update procedure is launched by sending a join or leave request for some attribute group from a user who wants to hold or drop the attribute to the corresponding authority. On receipt of the membership change request for some attribute groups, it notifies the storage node of the event. Without loss of generality, suppose there is any membership change in (e.g., a user comes to hold or drop an attribute at some time instance).

V REQUIREMENTS SPECIFICATIONS

This describes about the requirements. It specifies the hardware and software requirements that are required in order to run the application properly. The Software Requirement Specification (SRS) is explained in detail, which includes overview of this dissertation as well as the functional and non-functional requirement of this dissertation.

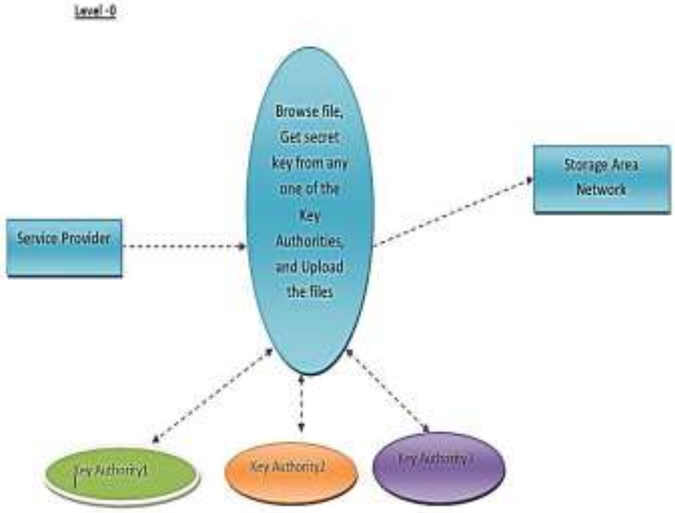
HARDWARE REQUIREMENTS:

Processor	: Intel core i5
Hard Disk	: 1 TB
RAM	: 2GB

SOFTWARE REQUIREMENTS:

Operating system	: Windows 7 or Windows 10.
Programming Language	: Java, Networking
Implementation	: MS Office
IDE	: Eclipse Galileo
Development Kit	: JDK 1.6

VI. FLOW DIAGRAM



VII.CONCLUSION

Therefore CP-ABE is a scalable cryptographic solution to the access control and secure data retrieval issues. In this paper, we proposed an efficient and secure data retrieval method using CP-ABE for decentralized network where multiple key authorities manage their attributes independently. The inherent key escrow problem is resolved such that the confidentiality of the stored data is guaranteed even under the hostile environment where key authorities might be compromised or not fully trusted. In addition, the fine-grained key revocation can be done for each attribute group. We demonstrate how to apply the proposed mechanism to securely and efficiently manage the confidential data distributed in the Wireless area network.

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