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Flexible Wildcard Searchable Encryption System

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Abstract: Searchable Encryption is a cryptographic technique which allows search of data in an encrypted format. This technique provides user data confidentiality insurance for public cloud storage service as well as allows multiple keyword search over encrypted data. Previously existing systems provide exact or fuzzy keyword search which corrects spelling errors only and their features are limited. In this paper, we propose a system known as adaptable wildcard searchable encryption system which allows mu.

Keywords: Searchable Encryption, Multiple keyword search, Auto generated wildcard search, Security assurance.

I. INTRODUCTION

Cloud computing greatly facilitates data providers who want to outsource their data to the cloud without disclosing their sensitive data to external parties and would like users with certain credentials to be able to access the data. This requires data to be stored in encrypted forms with access control policies such that no one except users with attributes (or credentials) of specific forms can decrypt the encrypted data. An encryption technique that meets this requirement is required, where a users private key is associated with an attribute set, a message is encrypted under an access policy (or access structure) over a set of attributes, and a user can decrypt a cipher text with his/her private key if his/her set of attributes satisfies the access policy associated with this cipher text. However, the standard ABE system fails to achieve secure deduplication, which is a technique to save storage space and network bandwidth by eliminating redundant copies of the encrypted data stored in the cloud. On the other hand, to the best of our knowledge, existing constructions for secure deduplication are not built on attribute-based encryption. Nevertheless, and secure deduplication have been widely applied in cloud computing, it would be desirable to design a cloud storage system possessing both properties.

Attribute-based encryption (ABE) has been widely used in cloud computing where a data provider outsources his/her encrypted data to a cloud service provider, and can share the data with users possessing credentials (or attributes). However, the standard ABE system does not support secure deduplication, which is crucial for eliminating duplicate copies of identical data in order to save storage space and network bandwidth.

We present an attribute-based storage system with secure deduplication in a hybrid cloud setting, where a private cloud is responsible for duplicate detection and a public cloud manages the storage.

II. LITERATURE SURVEY

Flexible wildcard searchable encryption system by Yang Yang, Ximeng Liu, Members, IEEE, Robert H. Deng, Fellow IEEE, Jian Weng. According to this paper published in 2017, searchable encryption is used to provide data confidentiality and to allow users to search over encrypted data with wildcard keyword queries. In this system wildcards need to be defined while uploading a file.

Hidden Policy ciphertext-policy attribute based encryption with keyword search against keyword guessing attack by Qui S, Liu J, Shi Y, et al, 2017 states attribute based keyword search and policy.

Fuzzy keyword search over encrypted data in cloud computing by Li J, Wang Q year 2010.Exploited edit distance to measure keywords similarity. It only deals with exact or fuzzy keyword search to correct some spelling errors. Efficient wildcard search over encrypted data by Hu C, Han L in 2015 introduced wildcard search over encrypted data but there was no auto generation of wildcard.

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III. System Analysis

3.1 Existing System

Fuzzy keyword search introduced in the existing system deals with exact or fuzzy keywords only to correct spelling errors. The edit distance to measure keyword similarity is small. It is useless if the edit distance of the query keyword is large. It was impossible to search multiple users' data simultaneously using one trapdoor. It is constructed based on a bloom filter. These Bloom filter based wildcard searchable encryption schemes return false results to users with a no negligible probability. Hence it decreases the Security assurance. Flexible wildcard searchable encryption does not generate wildcards automatically. There is no recovery option for the lost data.• This system will provide a transparent and trusted registration interface, reducing the frequency of registration frauds.

3.2 Proposed System

To save storage space and network bandwidth by eliminating redundant copies of the encrypted data stored in the cloud we propose a cloud storage system with both properties associated with attribute-based storage systems with secure Deduplication. De-duplication during a hybrid cloud environment, wherever a personal cloud is chargeable for duplicate detection and a public cloud manages the storage planned system compared with the previous information de- duplication systems. As our system supports high security and potency, additionally to boot file transfer upload file by specifying period and access policy.

In our system, we check deduplication of content by using tag and upload file in encryption format. Then the system will auto generate wildcards of all files and store them on cloud. End user can download this file by using a private key sent by the TPA while uploading the file. We propose a proxy server for the recovery of lost data.

IV. Implementation

4.1 Data Owner

Initially the data owner will upload their respective files on cloud with attribute constraints like time, date and access policy. After that the private key gets generated automatically which is known only to the data owner and a copy of that key is stored at TPA side for future work. Only the data owner has the rights to download the encrypted file by using a key which is generated at storing time. If the other user wants to download that file, he/she must know the decryption key, if the key get matched then the user is able to access or download that file successfully.

4.2 Third Party Auditor

The role of a third party authorizer is to grant excess policy to users except data owners by providing a tag and key to download the cloud stored data. TPA also checks for hacked files by sending requests to proxy servers. By providing file status it gives us a privacy policy. Data owners can recover the hacked data or file by help of TPA; TPA regenerates the tag and key for recovered data.

4.3 Proxy Server

The main role of a proxy server is to check whether the cloud stored file is hacked or not. If the data owner requested for stored file status then proxy server get invokes and as per file contained data , the server checks whether the file is get malicious or not , if changes occurred, then it will acknowledged to TPA that file is get hacked and as per data owner request proxy server get recovered all the hacked data.

4.4 Cloud Storage

Cloud storage is file storage in the cloud (online). Instead of keeping your files on your local hard drive, external hard drive, or flash drive, you can save them online. Cloud Server provides data storage space for the user/data owner to store the data that provides the secured and efficient way of storing the owner's data.

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V. System Architecture

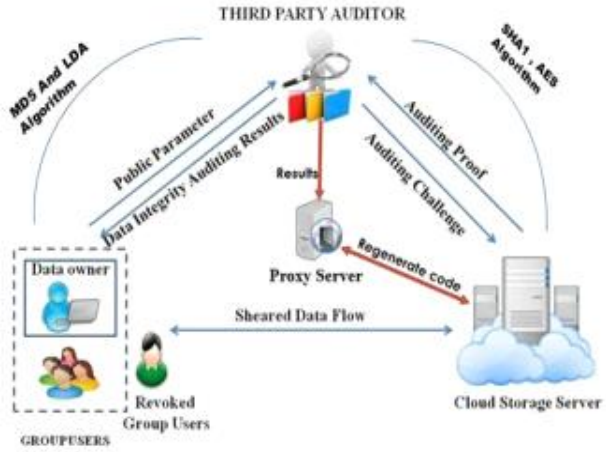
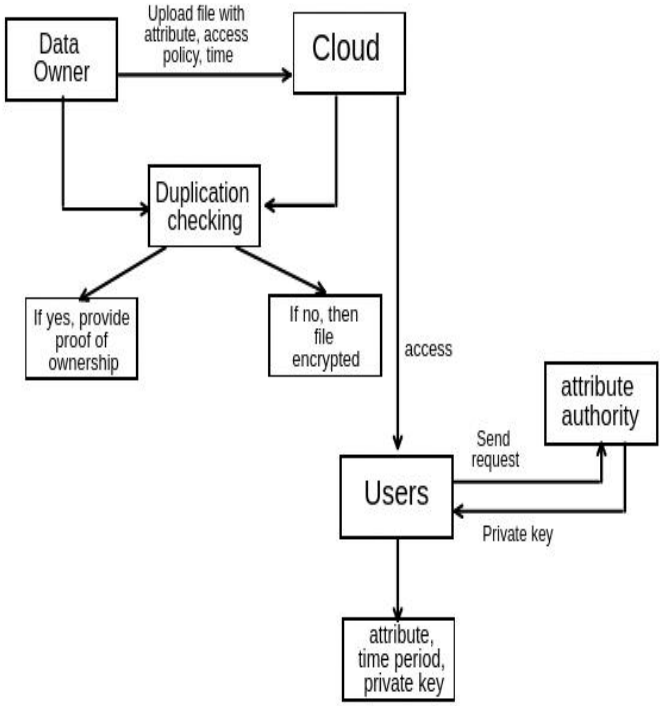


Figure: System Architecture

An entity named as data owner who uploads the files with attribute, time, access policy, time, deduplication. The uploaded files store on cloud but before that file get checked whether file is original or duplicate. And users who request for file downloading the file and to access the file. We used the AES algorithm for Encryption and Decryption of data.

VI. Dataflow Diagram

Initially the data owner will upload their respective files on cloud with attribute constrained like time, date and access policy with a tag. After that the stored data will be checked for deduplication, if the uploaded file is original then the file will get encrypted otherwise it will give reference to the original one which is on cloud. When the user wants to access that files which are stored on cloud, will send a request to TPA, after confirming the constraint the TPA will send a private key to the user to decrypt the file and then the user can successfully download the desired file.



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VII. Conclusion

Our proposed system provides a new and adaptable wildcard searchable encryption system for secure cloud storage service, which supports flexible wildcard representation, flexible search function and flexible user authorization revocation. By reducing the rate of hacked data, the system successfully recovered the hacked files to produce a security factor to stored data.

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