Multi Server Authentificatioin And Auditing In encrypted Clouds

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Abstract- *Cloud computing is the long dreamed vision of computing as a utility, where cloud customers remotely store their data into the cloud so as to enjoy the on-demand high-quality applications and services from a shared pool of configurable computing resources. Its great flexibility and economic savings are motivating both individuals and enterprises to outsource their local complex data management system into the cloud. To protect privacy of data and oppose unsolicited accesses in the cloud and beyond it, sensitive data, for instance, e-mails, personal health records, photo albums, tax documents, and so on, may have to be encrypted by data owners before outsourcing to the commercial public cloud; this, however, obsoletes the traditional data utilization service based on plaintext keyword search. The insignificant solution of downloading all the data and decrypting locally is clearly impractical, due to the large amount of bandwidth cost in cloud scale systems. Images also contain useful and important information, so proposed system also provides image tagging in MRSE scheme. Moreover, aside from eliminating the local storage management, storing data into the cloud doesn't serve any purpose unless they can be easily searched and utilized.*

I. INTRODUCTION

Cloud computing is the long dreamed vision of computing as a utility, where cloud customers can remotely store their data into the cloud Its great flexibility and economic savings are motivating both individuals and enterprises to outsource their local complex data management system into the cloud. To protect data privacy and combat unsolicited accesses in the cloud and beyond, sensitive data, for example, e-mails, personal health records, photo albums, tax documents, financial transactions, and so on, may have to be encrypted by data owners before outsourcing to the commercial public cloud[4]; this, however, obsoletes the traditional data utilization service based on plaintext keyword search. The trivial solution of downloading all the data and decrypting locally is clearly impractical, due to the huge amount of bandwidth cost in cloud scale systems. Moreover, a side from eliminating the local storage management, storing data into the cloud serves no purpose unless they can be easily searched and utilized. Thus, exploring privacy preserving and effective search service over encrypted cloud data is of paramount importance. Considering the Potentially large number of on-demand data users and huge amount of outsourced data documents in the cloud, this problem is particularly challenging as it is extremely difficult to meet also the requirements of performance, system usability, and scalability.

Ranked search can also elegantly eliminate unnecessary network traffic by sending back only the most relevant data, which is highly desirable in the “pay-as-you-use” cloud paradigm. Hence, exploring privacy-preserving and effective search service over encrypted cloud data is of great importance. To enhance the search result, need efficient methods to perform similarity search over large amount of encrypted data. I propose a secure index based encryption scheme to meet this requirement.

The basic building block of secure index is the state-of-the-art approximate near neighbor search algorithm in high dimensional spaces called locality sensitive hashing (LSH). LSH is extensively used for fast similarity search on plain data in information retrieval community. In my seminar, I propose to utilize it in the context of the encrypted data. In such a context, it is critical to provide rigorous security analysis of the scheme to ensure the confidentiality of the sensitive data. In fact, I provide a strong security definition and prove the security of the proposed scheme under the provided definition. In addition, I provide a real world application and verify the theoretical results with empirical analysis.

For data retrieval need, the large amount of documents demand the cloud server to perform result relevance ranking, instead of returning undifferentiated results. Such ranked search system enables data users to find the most relevant information quickly, rather than burdensomely sorting through every match in the content collection [5]. Ranked search can also elegantly eliminate unnecessary network traffic by sending back only the most relevant data, which is highly desirable in the “pay-as-you-use” cloud paradigm.

For privacy protection, such ranking operation, however, should not leak any keyword related information. On the other hand, to improve the search result accuracy as well as to enhance the user searching experience, it is also necessary for such ranking system to support multiple Keywords search, as single keyword search often yields far too coarse results.

In the seminar, searchable encryption [7], [8], [9], [10], [11] is a helpful technique that treats encrypted data as documents and allows a user to securely search through a single keyword and retrieve documents of interest. However, direct application of these approaches to the secure large scale cloud data utilization system would not be necessarily suitable, as they are developed as crypto primitives and cannot accommodate such high service-level requirements like system usability, user searching experience, and easy information discovery. Although some recent designs have been proposed to support Boolean keyword search [16] as an attempt to enrich the search flexibility, they are still not adequate to provide users with acceptable result ranking functionality. In My Seminar have been aware of this problem, and provide solutions to the secure ranked search over encrypted data problem but only for queries consisting of a single keyword. How to design an efficient encrypted data search mechanism that supports multi keyword semantics without privacy breaches still remains a challenging open problem.

In this Seminar, for the first time, I define and solve the problem of multi-keyword ranked search over encrypted cloud data (MRSE) while preserving strict system wise privacy in the cloud computing paradigm. Among various multi-keyword semantics, I choose the efficient Similarity measure of “coordinate matching,” i.e., as many matches as possible, to capture the relevance of data documents to the search query. Specifically, I use “inner product similarity”

[6], i.e., the number of query keywords appearing in a document, to quantitatively evaluate such similarity measure of that document to the search query. During the index construction, each document is associated with a binary vector as a sub index where each bit represents whether corresponding keyword is contained in the document. The search query is also described as a binary vector where each bit means whether corresponding keyword appears in this search request, so the similarity could be exactly measured by the inner product of the query vector with the data vector. However, directly outsourcing the data vector or the query vector will violate the index privacy or the search privacy. To meet the challenge of supporting such multi keyword semantic without privacy breaches, I propose a basic idea for the MRSE using secure inner product computation, which is adapted from a secure k-nearest neighbor (knn) technique [27], and then give two significantly improved MRSE schemes in a step-by-step manner to achieve various stringent privacy requirements

II. LITERATURE SURVEY

Searchable encryption has been an active research area and many quality works. Traditional searchable encryption schemes usually build an encrypted searchable index such that its content is hidden to the server, however it still allows performing document searching with given search query.

a. The first to investigate the techniques for keyword search over encrypted and outsourced data. Begin with idea to store a set of plaintext documents on data storage server such as mail servers and file servers in encrypted form to reduce security and privacy risks. The work presents a cryptographic scheme that enables indexed search on encrypted data without leaking any sensitive information to the untrusted remote server.
b. Proposed Boolean symmetric searchable encryption scheme. Here, the scheme is based on the orthogonalization of the keywords according to the Gram-Schmidt process.
c. Proposed privacy-preserving multi-keyword search method that utilizes min hash functions.
d. Developed the first searchable encryption using the symmetric settings, where anyone with the public key can write to the data stored remotely, but the users with private key execute search queries.
e. Studied the problem of secure ranked keyword search over encrypted cloud data. Explored the statistical measure approach that embeds the relevance score of each document during the establishment of searchable index before outsourcing the encrypted document collection. I propose a single keyword searchable encryption scheme using ranking criteria based on keyword frequency that retrieves the best matching documents.
f. Presented a multi-keyword ranked search scheme, where they used the principle of "coordinate matching" that captures the similarity between a multi-keyword search query and data documents. However, their index structure is uses a binary representation of document terms and thus the ranked search does not differentiate documents with higher number of repeated terms than documents with lower number of repeated terms.

The main objective here is to find out whether

a. The system will work once it is developed and installed.

b. There is sufficient support for the project from the management.
c. The current network methods are acceptable to the users.

An investigation is conducted and as a result the following conclusions are derived.

a. There is sufficient support from the managerial level.
b. The current methods are done manually and take lot of time.

The persons involved in the current working system are met and discussions are held with them to evolve a system with they have good participations and interest.

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III. PROBLEM DEFINATION

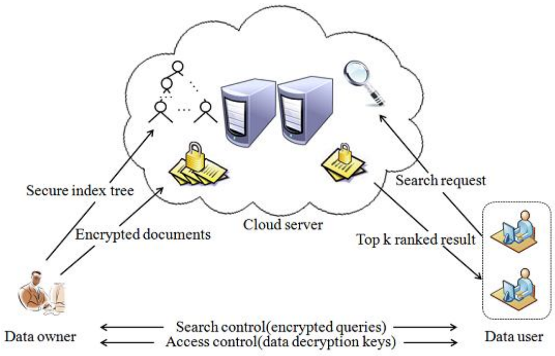
Computing is the long dreamed vision of computing as a utility, where cloud customers can remotely store their data into the cloud so as to enjoy the on-demand high-quality applications and services from a shared pool of configurable computing resources. Its great flexibility and economic savings are motivating both individuals and enterprises to outsource their local complex data management system into the cloud. To protect data privacy and combat unsolicited accesses in the cloud and beyond, sensitive data, for example, e-mails, personal health records, photo albums, tax documents, financial transactions, and so on, may have to be encrypted by data owners before outsourcing to the commercial public cloud.

IV. PROPOSED MECHANISM

To enable efficient similarity search, data owner builds a secure index and outsources it to the cloud server along with the encrypted data items. Server performs search on the index according to the queries of the data users without learning anything about the data other than what data owner allows an adversary to learn. In Phase-I, we present the index structure. In Phase-II, we describe the search scheme that is built on top of the index. There are different phases.

As an enhancement we enhance the existing system and in this paper we propose an effective approach to solve the problem of multi-keyword ranked search over encrypted cloud data supporting synonym queries. The main contribution of this paper is summarized in two aspects: multi-keyword ranked search to achieve more accurate search results and synonym-based search to support synonym queries. Meanwhile, existing search approaches over encrypted cloud data support only exact or fuzzy keyword search, but not semantics-based multi-keyword ranked search. Therefore, how to enable an effective searchable system with support of ranked search remains a very challenging problem.

V. PROPOSEDSYSTEM ARCHITECTURE



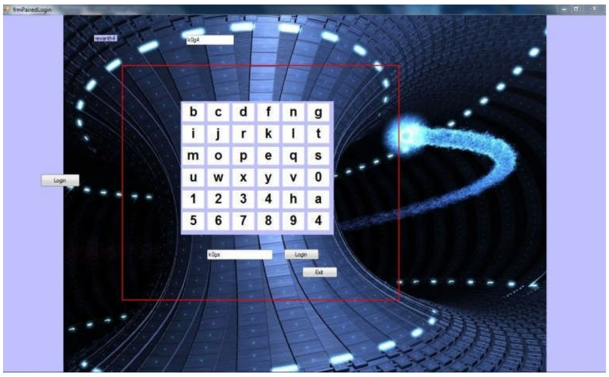
VI.PAIR-BASEDAUTHENTICATION SCHEME

In the course of registration, the user submits

The secret pass. The minimum length of the secret pass is 8 and it should contain even number of characters. During the primary level authentication, when the user chooses the pair-based authentication scheme, an interface consisting of 6X6 grid is displayed. The grid contains both alphabets and numbers which are placed at random and the interface changes every time.

The mechanism involved in the pair-based authentication scheme is as follows: Firstly, the user has to consider the secret pass in terms of pairs. The first letter in the pair is used to select the row and the second

Letter is used to select the column in the 6X6 grid. The intersection letter of the selected row and column generates the character which is a part of the session password. In this way, the logic is reiterated for all other pairs in the secret pass [18]. Thereafter, the password inputted by the user i.e. the session password is now verified by the server to authenticate the user.



k0g4

b	c	d	f	n	g
i	j	r	k	l	t
m	o	p	e	q	s
u	w	x	y	v	0
1	2	3	4	h	a
5	6	7	8	9	4

k0ga

Figure: Pair-based Login Screen

VII. CONCLUSION

In this paper, for the first time we define and solve the problem of multi-keyword ranked search over encrypted cloud data, and establish a variety of privacy requirements. Among various multi-keyword semantics, we choose the efficient similarity measure of “coordinate matching,” i.e., as many matches as possible, to effectively capture the relevance of outsourced documents to the query keywords, and use “inner product similarity” to quantitatively evaluate such similarity measure. For meeting the challenge of supporting multi-keyword semantic without privacy breaches, we propose a basic idea of MRSE using secure inner product computation. Then, we give two improved MRSE schemes to achieve various stringent privacy requirements in two different threat models. We also investigate some further enhancements of our ranked search mechanism, including supporting more search semantics, i.e., TF_IDF, and dynamic data operations. Thorough analysis investigating privacy and efficiency guarantees of proposed schemes is given, and experiments on the real-world data set show our proposed schemes introduce low overhead on both computation and communication. In our future work, we will explore checking the integrity of the rank order in the search result assuming the cloud server is untrusted.

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