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Health Monitoring For Secrecy Conserving Using Cloud Computing

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Abstract

Cloud-assisted mobile health monitoring will applies the existing mobile communications and cloud computing knowledges to provide responsing decision support, which has been considered as a uprising approach to improve the quality of the healthcare services by lowering the healthcare cost. Regrettably, it also poses a severe risk on both client's privacy and on the intellectual property of monitoring service providers, which could determine the wide adoption of mobile health technology. This paper is used to address the important problem and to design a cloud-assisted privacy conserving mobile health monitoring system to protect the privacy of the involved clients and their private datas. In addition, the subcontracting decryption method and a newly proposed private key substitute re encryption are adapted to change the computational difficulty of the involved clients to the cloud without cooperating client's privacy and service providers logical property. In concluding, our privacy and performance analysis expresses the successful of our proposed system design.

I. INTRODUCTION

The exploitation of mobile devices, as smartphones which is equipped with low cost antennas, has already shown in great possible by improving the healthcare service qualities. Remote mobile health monitoring has recognized as not as a possible. The "MediNet" has designed to realize the remote monitoring of the health status of diabetes and cardiovascular diseases in remote areas. Such a remote mobile health monitoring system, a client could set up portable sensors in wireless sensor networks to collect the various physiological datas, such as blood pressure, breathing rate, Electrocardiogram, and blood glucose. This physiological datas could be sent to a central server, which could run in various web medical applications and these datas return in timely advice to the client.

Even though, the cloud-assisted mobile health monitoring could offer a great prospect to improve the quality of the healthcare services and to reduce the healthcare costs, and there is a stumbling block in making this technology as a real one. Without addressing the datamanagement in a mobile health system, clients privacy may be severely violated during the compilation, storage, diagnosis, message and computing. In addition, the current law is mainly focused on safety against intrusions while there is a little effort on the protecting the clients from the business private information. In the mean time, many companies have been significant industrial interest in collecting the clients private health datas and sharing them with the insurance companies and the research institutions or even with the government agencies.

II. PROPOSED SYSTEM

In this paper, we designed a cloud-assisted mobile health monitoring system (CAM). First identify the design problems on the privacy preservation and then provide the solutions. To understand the basic scheme we can identify the possible privacy violates. It will provide an improved scheme by addressing the identified privacy problems. The resulting improved scheme allows the mobile health service provider to be offline after the setup has staged and it enables to deliver the datas or programs to the cloud securely.

To reduce the clients decryption difficulty, we integrate the recent proposed subcontracting decryption method into the underlying multi-dimensional range query system to shift the clients computational difficulty to the cloud without exposing any information to clients query input or the decrypted decision to the cloud. To relieve the computational complexity on the company's side, which is proportional to the number of clients, we propose a further improvement, leading to our final scheme. It is based on a new variant of key private proxy re-encryption scheme, in which the company only needs to accomplish encryption once at the setup phase while shifting the rest computational tasks to the cloud without compromising privacy, further reducing the computational and communication burden on clients and the cloud.

III. SYSTEM MODEL

CAM consists of four parties: the cloud server, the company which provides the mHealth monitoring service, the individual clients, and a semi trust authority (TA). The company stores its encrypted monitoring data or program in the cloud. Individual clients collect their medical data and store them in their mobile devices, which then transform the data into attribute vectors. The attribute vectors are delivered as inputs to the monitoring program in the cloud through a mobile phone. TA is responsible for distributing private keys to clients and collecting service fees from clients according to a certain business model such as "pay-per-use" model. TA can be considered as a collaborator or a management agent for a company or several companies and thus shares certain level of mutual business interest with the company.

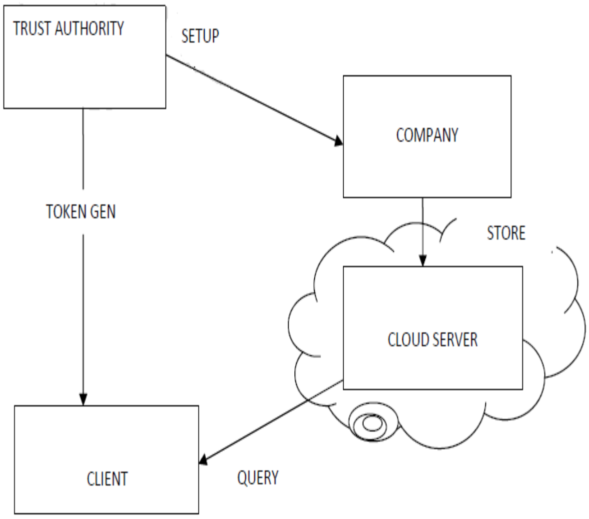

Fig 1.1. System Architecture of CAM

There are four phases in the process, such as 1)Setup 2)Store 3)Token Generation 4)Query.

At the initial phase, TA runs the Setup phase and publishes the system parameters. Then, the company first characterizes the flow chart of a mHealth monitoring program as a branching program, which is encrypted under the respective directed branching tree.The Fig 3.1 show that contain the four types of algorithm which used in CAM Then the company will deliver the resulting cipher text and its company index to the cloud, which corresponds to the Store algorithm in the context. When a client wishes to query the cloud for a certain mHealth monitoring program, the client and TA run the Token Gen algorithm. The client sends the company index to TA, and then inputs its private query (which is the attribute vector representing the collected health data) and TA inputs the master secret to the algorithm. The client obtains the token corresponding to its query input while TA gets no useful information on the individual query. At the last phase, the client delivers the token for its query to the cloud, which runs the Query phase. The cloud completes the major computationally intensive task for the client's decryption and returns the partially decrypted cipher text to the client. The client then completes the remaining decryption task after receiving the partially decrypted cipher text and obtains its decryption result, which corresponds to the decision from the monitoring program on the client's input. The cloud obtains no useful information on either the client's private query input or decryption result after running the Query phase. Here, we distinguish the query input privacy breach in terms of what can be inferred from the computational or communication information. CAM can prevent the cloud from deducing useful information on a client's query input or output corresponding to the received information from the client.

IV. MODULE DESCRIPTION

A) Branching Program

To describe the branching program, which include binary classification or decision trees as aspecial case. The binary branching program for the ease of exposition since a private query protocol based on a general decision tree can be easily derived from our scheme. Let v be vector of clients attributes. To be more specific, an attribute component *vi* is a concatenation of an attribute index and the respective attribute value. For instance, A||KW1 might correspond to blood pressure: 130. Those with a blood pressure lower than 130 are considered as normal, and those above this threshold are considered as high blood pressure. The first element is a set of nodes in the branching tree. The non-leaf node p*i* is an intermediate decision node while leaf node p*i* is a label node. Each decision node is a pair (*ai*, *ti*), where *ai* is the attribute index and *ti* is the threshold value with which *vai* is compared at this node.

The same value of *ai* may occur in many nodes, the same arrribute may be evaluated more than once. For each decision node *i*, *L (i)* is the index of the next node if *vai<ti*, *R (i)* is the index of the next nodes are attached with classification information. Repeat the process recursively for p*h*, and so on, until one of the leaf node is reached with decision information.

B) Token Generation

To generate the privacy key for attribute vector v= (v1,...,vn), a client first computes the identity representation set of each element in v and delivers all the *n* identity representation sets to TA.Then TA runs the Anon Extract(id,msk)on each identity id Svi in the identity set and delivers all the respective private keys skv*i* to the client.

C) Query

A client delivers the private key sets obtained from the token generation algorithm to the cloud, which run the AnonDecription algorithm on cipher text should be decrypted next. For instance, if *v1*[0,t1], then the decryption result indicates the next node index L(i).The cloud will then use sk*y(L(i))* to decrypt the subsequent cipher text *CL(i).* Continue this process iteratively until it reaches a leaf node and decrypt the respective attached information.

D) Semi trusted authority

A semi-trusted authority is responsible for distributing private key to individual clients and collecting the service fee from the client according to a certain business model such as pay-as-you-go business model. The TA can be considered as a collaborator or a management agent for a company and thus shares certain level of mutual interest with the company. However, the company and TA could cloud to obtain private health data from client input vectors.

V. CONCLUSION

To design a secrecy conserving for mobile health monitoring system, which can be effectively protect the privacy of the clients and the intellectual property of mobile health service providers. To reduce the decryption difficulty due to the use of confidential data, and the recently proposed decryption subcontracting with privacy protection to shift the clients communication to the server in the cloud. To protect the mobile heath service providers programs, and is expanded in the sub-program tree by using the random permutation, the decision entries used at the decision sub-nodes. Therefore, to enable the resource-limited small companies to participate in the mobile health business, the system design helps them to shift the communicational burden to the cloud by applying newly developed Triple Data Encryption Standard technique. In Future plan we have to make a better solution for the Secure and fast performance.

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