E-Health for Security and Privacy in Health Care System Using Hadoop Map Reduce

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---**ABSTRACT**--

Big data and cloud computing is the backbone to the modern Data Storage. Which provide a perfect security for data repository in the recent systems and managed with the cloud computing. Hadoop is the core platform for structuring Big Data, and solves the problem of making it useful for analytics purposes. It is designed to scale up from a single server to thousands of machine, with a very high degree of defect easily. In this paper, a useful e-health protection framework using Map Reduce technique is proposed.

Keywords: **E-Health, Big Data, Hadoop, Cloud, Map Reduce**

I. INTRODUCTION:

The main functions of the cloud server are to create the interface between application and user. To connect with server must give their username and password then only they can able to connect the server. If the user already exits directly can login into the server else user must register their details such as username, password, and Email id, keen on the server. The server will create the account for the entire user to maintain upload and download rate.

Zhang Xin, et al explained, Cost Effective, on-demand self - service, Ubiquitous network access, fast flexibility, elevated dependability, flexibility in cloud computing performance, accessibility and safety are major research topics. Among them, cloud computing security is one of the important research topics.[2] Han Hu, et al pointed out that the Map Reduce is in useful in a number of areas where huge data analysis is required [3].Tom White clarified many applications which handle the huge data sets have been developed [4].

R.Agrawal, et al described, E-health has increased its success and popularity in a short period of time. In practical, the system has to be secured and e-health service provider is entrusted with the responsibility to handle the sensitive information [1].

D. C. Kaelber et al stated, now organizations invests millions of dollars in the best PHR architectures, value propositions, and descriptions [5]. Ming, et al presented the personal health record is used to store the data onto the user in secure and in an efficient way. It will be a valuable asset to individuals and family, enabling them to combine and manage their healthcare information using safe, standardized tools [6]. Individuals own and manage the information about the PHR, which comes from healthcare providers. The personal health record as been maintained by a private environment so that only authorized user can access the data. The PHR does not replace the legal record of any provider [7]. D. T. Mon, et al Describe In others words, they are electronic health records (EHRs) that are owned by patients. Which contain medical data generated within one specific care institution [8, 9].

II. RELATED WORK:

Haluk Demirkan illustrates Electronic Health Records Systems (HER) store the entire patient's medical history information about the time of an admission, medical tests performed on the patient, medicine prescriptions, readmission information and any other relevant information of the patient. These data has to be available and managed by all health care providers [10].

Nowadays, the data that need to be analyzed are not just large, but they are collected of various data types, and even including streaming data [11].Although it seems that big data makes it possible for us to collect more data to find more useful information, the truth is that extra data do not automatically mean more useful information. It may contain more unclear or irregular data. For instance, a user may have various accounts, or an account may be used by various users, which may degrade the correctness of the mining results [12]. Therefore some new issues for data analytics arrive up. Such as privacy, safety, storage, fault charity, and worth of data [13].

Map Reduce is a framework of efficiently processing the analysis of big on a large number of servers. It was developed for the support for Google's search engine to enable number of commodity servers to efficiently process the analysis of huge numbers of

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web pages collected from all over the world [14].Apache [15, 16] developed a project to implement Map Reduce, which was published as open source software (OSS), this enables lots of organization, such as business and university, to tackle big data analysis .Map Reduce [17] is a simple programming model for processing he data sets in parallel.

The GMR (Google Map Reduce) was invented by Google back in their earlier days so they could usefully index all the rich textural and structural information they were collect, and then present significant and actionable results from users. Map Reduce (you map the operation out to all of those servers and then you reduce the results back into a single result set), is a software paradigm for dispensation a large data set in a distributed similar way [18].

A small Hadoop cluster includes an only master and several employee nodes. The master node consists of a Job follower, Name node and Data node. A slave or employee node acts as both a Data nodule and Task follower, though it is possible to have data-only employee nodes and compute-only employee nodes. These are usually used only in unusual applications. Hadoop requires safe Shell to be between nodes in the cluster. In a big cluster, the HDFS is managed through a committed Name Node server to host the file system index, and a secondary Name Node that can create snapshots of the name node's memory structures, thus preventing file-system fraud and tumbling failure of data [19]

III. PROPOSED WORK:

The proposed e-health care framework that is presented in figure 1.In this framework, firstly, the user logs on by using username, password and by providing unique biometric information to secure user identity. Secondly, Request for Service is generated by the admission department to get request for the database and external third parties. For instance, cloud computing. Thirdly, after administrator requests for the service, health requester who asks for access to store personal health information is known as Data can decrypt the encrypted Personal Health Information (PHI). Fourthly, after requesting to access the PHI, then Single point of contact checks whether the user is allowed to access the service or not. If the user gets allowed to access the service. Administrator can easily access the patient coming from external hospital or referred by doctor. Then Personal Health Information is transferred to Health Service by using a new proposed framework MA-ABE (Multi Authority Attribute based Encryption). In our current framework, the encryption technique CP-ABE(Cipher Policy Attribute Based Encryption)that was used to secure e-health system is average as new enhanced encryption technique can be used to overcome this technique which provides fin access control with excellent as compared to CP-ABE. In addition, its efficiency is scalable as compared to current solution and it's collision resistant.
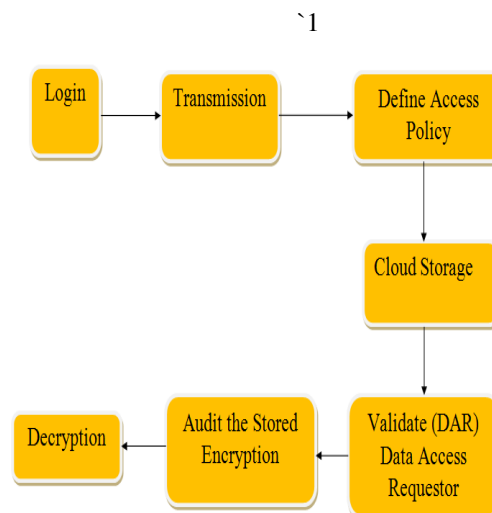
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Figure 3.1: Methodology for E-Health Care

Figure 2 shows the patient and Health service provider shared the key having public and private key. Patient sends encrypted information about image of the health service provider. After receiving the message from the patient, Health service provider decrypted the message and ensure by validating the image, if it is verified then health service to provide to encrypt personal health information according to patient defined policy. After the transmission of personal health information about health service providers, PHI is stored at cloud. To get access to sensitive information data access requester sends access request to cloud service providers and then health service providers executes the access request. The current selected solution has different features. It ensures patient identity privacy, make sure PHI integrity and source authentication, simply revoke malicious user, resistant to collusion attack and, and patient-centric access control.

This solution also has some limitation. Collision resistant cannot completely be elevated to this encryption method. Fine gained access control is average in the CP-ABE method. Efficiency in this framework is not scalable. And Average authentication and authorization is the limitation.
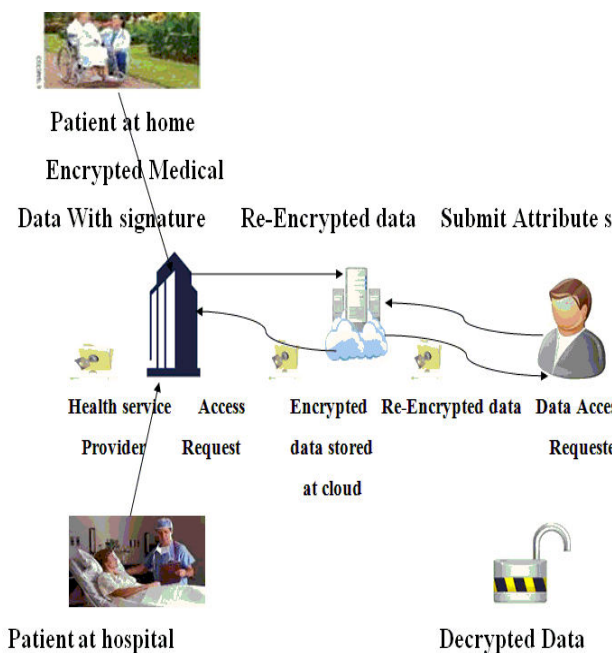
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Figure 3.2: Proposed frameworks for E-Health Environment

IV. IMPLEMENTATION RESULT:

Any organization can use this application to store their patient medical information. PHR allows also the controlled sharing of application software that is required to view and analyze health records. Here the patient data is shared securely among cloud using ABE (Attribute Based Encryption) technique. Using this technique each user generated one private key depends upon the user data. The security key used to retrieve the uploaded data. Suppose one user uploads many data means the same authorized key is used to retrieve that user data. All that keys are securely maintained by individual. This key will be shared by particular user via e-mail id. By using to attribute based encryption, we reduce the key management problem and also enhance privacy guarantees which play an important role because these are unique and not easily hackable.

V. CONCLUSION:

Security in health care should increase quality of health care and reduce the cost of health care. In our research, we have proposed a framework that provides security for health care. Our research focuses on securing health care from attacks by unauthorized users and also identifies the threats and vulnerabilities in health care. It highlights the approach and technique that is equally used in security Health IT and also reflect cyber security threats. This proposed research describe in securing health records of the efficient and scalable by using Attribute in Based Encryption (ABE) techniques for securing PHR.

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