

# International Journal of Innovative Research in Science, Engineering and Technology

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## Medical Data Sharing for Protection and Intrusion Avoidance in Cloudlet

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**ABSTRACT:** Health Record of an individual personal is a vital way that can be utilized for keeping track of patient data in accurate, reliable as well as complete manner. For all intents and purposes, restorative information sharing is a basic and testing issue. Consequently in this paper, we develop a novel human services framework by using the adaptability of cloudlet. The elements of cloudlet incorporate security insurance, information sharing and interruption location. In the phase of information accumulation, we initially use Number Theory Research Unit (NTRU) technique to scramble client's body information gathered by wearable device. That information will be transmitted to adjacent cloudlet in a vitality proficient form. Furthermore, we exhibit another trust model to enable clients to choose trustable accomplices who to need to share put away information in the cloudlet. The trust display additionally causes comparable patients to speak with each other about their sicknesses. Thirdly, we isolate clients' medicinal information put away in remote billow of healing facility into three sections, and give them appropriate insurance.

**KEYWORDS:** Privacy Protection, Data Sharing, Collaborative Intrusion Detection System (IDS), Healthcare.

### I. INTRODUCTION

This medical data on the social network is beneficial to both patients and doctors, the sensitive data might be leaked or stolen, which causes privacy and security problems without efficient protection for the shared data. In Cao et al, an MRSE (multi-keyword ranked search over encrypted data in cloud computing) privacy protection system was presented, which aims to provide users with a multi-keyword method for the cloud's encrypted data [1]. Although this method can provide result ranking, in which people are interested, the amount of calculation could be cumbersome. A priority based health data aggregation (PHDA) scheme was presented to protect and aggregate different types of healthcare data in cloud assisted wireless body area network (WBANs). The article investigates security and privacy issues in mobile healthcare networks, including the privacy-protection for healthcare data aggregation, the security for data processing and misbehavior [2]. Describes a flexible security model especially for data centric applications in cloud computing based scenario to make sure data confidentiality, data integrity and fine grained access control to the application data. It gives a systematic literature review of privacy-protection in cloud-assisted health care system.

#### a) Background

It is challenging issue to personalize specific healthcare data for various users in a convenient fashion. Previous work suggested the combination of social networks and healthcare service to facilitate the trace of the disease treatment process for the retrieval of real time disease information. Healthcare social platform, such as Patients-Like Me, can obtain information from other similar patients through data sharing in terms of user's own findings. Though sharing medical data on the social network is beneficial to both patients and doctors, the sensitive data might be leaked or stolen, which causes privacy and security problems without efficient protection for the shared data. We use trust model to evaluate trust level between users to determine sharing data or not. Considering the users' medical data are stored in remote cloud, we classify these medical data into different kinds and take the corresponding security policy. In addition to above three stages based data privacy protection, we also consider collaborative IDS based on cloudlet mesh to protect the cloud eco system.

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## b) Motivation:-

We divide data in remote cloud into different kinds and utilize encryption mechanism to protect them respectively. We propose collaborative IDS based on cloudlet mesh to protect the whole healthcare system against malicious attacks.

## c) Goal and Objective:-

### Goal:-

The main goal achieving both data sharing and Intrusion detection in cloud.

Medical Data Sharing: The first design goal of this work is to provide the capability of verifying correctness of the remotely stored data. The data sharing requires two features:

- 1) Trust Authority, which checks the similarity of the two users based on symptoms to check the how much match the similarity in low, medium, high levels.
- 2) Trust Model, which is based on the data sharing to how much any user shares their information to find their trust level.

Intrusion Detection. The second design goal of this work is intrusion detection on cloudlet. In other words, it detects the malicious attack to cloudlet and detection rate on cloudlet. It provides a fire alarm.

## d) Objective:-

- The main objective of proposed system is to provide for a quick and efficient retrieval of information.
- The level of accuracy in the proposed system will be higher. All operation would be done correctly and it ensures that whatever provides better security to medical data.

## II. REVIEW OF LITERATURE

**A. Sajid and H. Abbas** [1]. The system is privacy-assured where cloud sees neither the original samples nor underlying data. It handles well sparse and general data, and data tampered with noise. We have proposed a privacy-aware cloud assisted healthcare monitoring system via compressive sensing. The random mapping based protection ensures no sensitive samples would leave the sensor in unprotected form. Wireless sensors are being increasingly used to monitor/collect information in healthcare medical systems. Despite the increasing popularity, how to effectively process the ever-growing healthcare data and simultaneously protect data privacy, while maintaining low overhead at sensors, remains challenging.

**R. Mitchell and I.-R. Chen** [2]. We demonstrate that our intrusion detection technique can effectively trade false positives off for a high detection probability to cope with more sophisticated and hidden attackers to support ultra safe and secure MCPS applications. For safety-critical MCPSs, being able to detect attackers while limiting the false alarm probability to protect the welfare of patients is of utmost importance. We plan to analyze the overheads of our detection techniques such as the various distance-based methods in comparison with contemporary approaches. We propose and analyze a behaviour-rule specification-based technique for intrusion detection of medical devices embedded in a medical cyber physical system (MCPS) in which the patient's safety is of the utmost importance.

**Y. Shi, S. Abhilash, and K. Hwang** [3]. We have specified a sequence of authentication, authorization, and encryption protocols for securing communications among mobile devices, cloudlet servers, and distance clouds. Securing mobile cloud services is the major barrier to the integration of BTOD (bring your own devices) and BYOC (bring your own cloud) in our daily applications. We use the cloudlet mesh to perform collaborative intrusion detection among multiple cloudlets. Network attacks are a serious matter that confronts both cloud providers and massive number of mobile users who access distance clouds in our daily-life operations. We extend their work to support security functionalities in offloading the distance clouds.

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**M. S. Hossain** [4]. The proposed approach uses Gaussian mixture modelling for localization and is shown to outperform other similar methods in terms of error estimation. The design and development of such systems requires access to substantial sensor and user contextual data that are stored in cyberspace. We will conduct more workload measurements to record the resource utilization of CPU, memory, storage, and network bandwidth. This enables a range of emerging applications or systems such as patient or health monitoring, which require patient locations to be tracked.

**M. Quwaidar and Y. Jararweh** [5]. The proposed work also attempts to minimize the end-to-end packet delay by choosing dynamically a neighbour cloudlet, so that the overall delay is minimized. The goal was objective to minimize end-to-end packet cost by dynamically choosing data collection to the cloud using cloudlet based system. Performance of the proposed system was evaluated via extended version of Cloud-Sim simulator. The huge amount of data collected by BAN nodes demands scalable, on-demand, powerful, and secures storage and processing infrastructure.

**J. Zhao, L. Wang, J. Tao, J. Chen, W. Sun, R. Ranjan, J. Kołodziej, A. Streit, and D. Georgakopoulos** [6]. We describe an EHR security reference model for managing security issues in healthcare clouds, which highlights three important core components in securing an EHR cloud. The goal of this research is to advance the Map Reduce framework for large-scale distributed computing across multiple data centers with multiple clusters. The designed security framework has the ability to prevent the most common attacks, such as MITM attack, replay attack, and delay attack, and ensures a secure communication of GHadoop over public networks. The Map Reduce tasks are firstly scheduled among the clusters using Hadoop's data-aware scheduling policy and then among compute nodes use the existing cluster scheduler on the target clusters.

**N. Cao, C. Wang, M. Li, K. Ren, and W. Lou** [7]. We first offer a basic idea for the multi keyword ranked search over encrypted cloud data (MRSE) based on effective comparison measure of coordinate matching. We have taken a methodical approach to investigating security models and security requirements for healthcare application clouds. We have discussed important concepts related to EHR sharing and integration in healthcare clouds and analyzed the arising security and privacy issues in access and management of EHRs. The widespread use of electronic health record (EHR), building a secure EHR sharing environment has attracted a lot of attention in both healthcare industry and academic community.

**H. Mohamed, L. Adil, T. Saida, and M. Hicham** [8]. We propose a collaborative model consists of the Intrusion Detection and Prevention System functions based distributed IDS and IPS, with the use of a hybrid detection technique for addressing the problems of attacks encountered, specifically distributed attacks such as port scanning attacks and distributed internally established within a Cloud Computing environment by users entitled to access, including the integration of the Signature Apriori Algorithm for generating new attack signatures whose objective is to develop the functioning of our security system to be able to detect and block various types of attacks and intrusions. Security solutions are not yet adapted to this new concept. Indeed, in such an environment, the more customers and paths, the greater the intrusion is effective. We also incorporate the signature apriori algorithm to enrich and update our database signature to analyze and compare information received. Cloud Computing has emerged as a model to process large volumetric data. They add that Cloud Computing deals with different fundamentals like virtualization management, fault tolerance and load balancing.

**R. Zhang** [9]. We describe an EHR security reference model for managing security issues in healthcare clouds, which highlights three important core components in securing an EHR cloud. We have taken a methodical approach to investigating security models and security requirements for healthcare application clouds. We have discussed important concepts related to EHR sharing and integration in healthcare clouds and analyzed the arising security and privacy issues in access and management of EHRs. The widespread use of electronic health record (EHR), building a secure EHR sharing environment has attracted a lot of attention in both healthcare industry and academic community.

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**K. Hung, Y. Zhang, and B. Tai** [10]. As an important part of this system, a cuffless BP meter has been developed and tested on 30 subjects in a total of 71 trials over a period of five months. Use of mobile communication is no longer limited to telephony. New interests and demands are wireless data and multimedia services, as 3G phones are available. The world's ageing population and prevalence of chronic diseases have lead to high demand for tele-home healthcare, in which vital-signs monitoring is essential.

### III. EXISTING SYSTEM

With the advances in distributed computing, a lot of information can be put away in different clouds, including cloudlets and remote cloud, encouraging information sharing and escalated calculations. Be that as it may, cloud-based information sharing entails the following crucial issues: How to ensure the security of client's body information data its conveyance to a cloudlet? How to ensure the information partaking in cloudlet won't cause protection issue? As can be anticipated, with the expansion of electronic medicinal records (EMR) and cloud-helped applications, more and more considerations ought to be paid to the security issues in regards to a remote cloud containing human services huge information. How to secure the medicinal services huge information put away in a remote cloud? How to adequately shield the entire framework from malevolent assaults?

### IV. PROPOSED SYSTEM

This paper proposes a cloudlet based healthcare framework. The body information fetches from user and sends to the near cloudlet. That information is additionally conveyed to the remote cloud where specialists can get to for disease finding. In the main stage, user's vital signs gathered by wearable gadgets are conveyed to gateway of cloudlet. In this stage, information security is the primary concern. In the second stage, user information will be extra conveyed toward remote cloud through cloudlets. A cloudlet is framed by a specific number of cell phones whose proprietors may require as well as offer some particular information substance. In this manner, both security insurance and information sharing are considered in this stage. Especially, we utilize trust model to assess trust level between users to decide sharing information or not. Considering the clients' restorative information is put away in remote cloud, we characterize these medicinal data into various types and take the relating security approach. In addition to over three phases based information security assurance, we additionally consider community oriented IDS in light of cloudlet work to ensure the cloud eco framework. We propose some question and answer technique between user and doctors.

### V. SYSTEM ARCHITECTURE

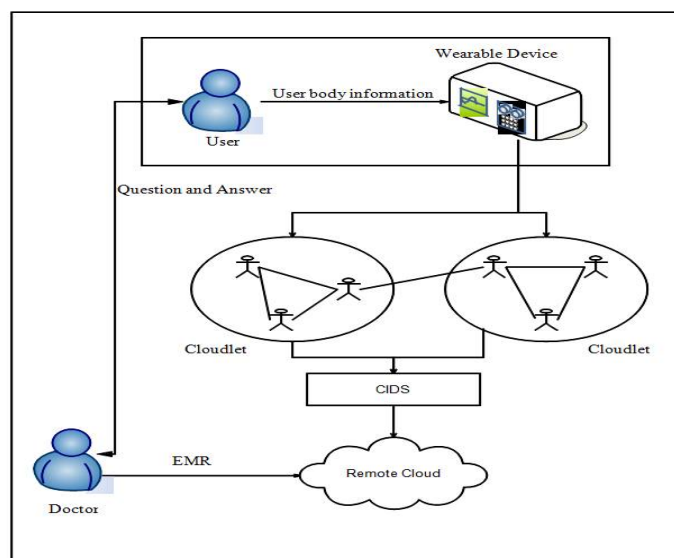


Fig 1. Architecture Diagram

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For the user body information fetch using the wearable device and then provide transfer this information to the cloudlet. But we provide the privacy of user information. This information is transfer to the cloudlet in encrypted format. In cloudlet is share information on user symptoms. Doctor fetched information from remote cloud and checks the user EMR Report. User asked question to the doctor through online for small disease.

## VI. ALGORITHM

**Number Theory Research Unit (NTRU):-**

**Input:-** F, G, Message .

**Output:-** encrypt and decrypt message.

Step 1: Two small polynomial f and g.

Step 2: The large modulo p and modulo q.

Step 3: The inverse of f modulo q and the inverse of f modulo p.

Step 4:  $f * fq = 1 \pmod{q}$  and  $f * fp = 1 \pmod{p}$

Step 5: Generating  $fp = f-1 \pmod{p}$  and  $fq = f-1 \pmod{q}$ .

Step 6: The private key pair and the public key h is calculated using p, fq and g.

Step 7: public key is  $h = pfq * g \pmod{q}$ .

Step 8: Encryption uses m, r and the public key h to generate e, the encrypted message that is as follows:  $e = r * h + m \pmod{q}$ .

Step 9: First uses the private key f to calculate:  $a = f * e \pmod{q}$ .

Step 10:  $c = fp * b \pmod{p}$

If decryption has successfully completed, then the polynomial c will be equal to the original message.

## VII. CONCLUSION

In this project, we investigated the problem of privacy protection and sharing large medical data in cloudlets and the remote cloud. We developed a system which does not allow users to transmit data to the remote cloud in consideration of secure collection of data, as well as low communication cost. However, it does allow users to send data to a cloudlet, which triggers the data sharing problem in the cloudlet. Firstly, we can utilize wearable devices to collect users' data, and in order to protect users privacy, we use NTRU mechanism to make sure the transmission of users' data to cloudlet in security. Secondly, for the purpose of sharing data in the cloudlet, we use trust model to measure users' trust level to judge whether to share data or not. Thirdly, for privacy-preserving of remote cloud data, we partition the data stored in the remote cloud and encrypt the data in different ways, so as to not just ensure data protection but also accelerate the efficacy of transmission. Finally, we propose collaborative IDS based on cloudlet mesh to protect the whole system. User asks the question to the doctor online and doctor give the answer to user.

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