IOT Based HealthCare System

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Abstract: Now a days, with the rapid use of the Internet and implementation as well as the development of the medical sensor for the healthcare applications. Even Internet if Things is getting more popularity. IOT is a sensor that is connected with the embedded system. All the sensors and the device connected to each other so that the transmission between those sensors becomes easy. In the healthcare System medical data are so sensitive in nature. Cloud Computing plays an important role in IT-health. All the medical data of the patient as well as doctors and patient personal information is stored in local mode and in cloud, So whenever the data is needed the data will be easily available. Security is the most crucial part of healthcare. The access control policy is based on right to access of medical data and privilege to authorized entity which is directly and indirectly connected with the patient health.

1. INTRODUCTION

World is considered as a Smart Object, and that allows them to interact each other through Internet by physically or virtually. IOT get approval to people and the things to be connected and communicated at anytime, anywhere with anyone. Internet of Things (IOT) is an ideal technology, in the general way IOT is an approach to connect living things and non-living things with the help of internet. In the traditional way, everything in the world is like an object, but in IOT paradigm everything in the

The information from medical department which is very sensitive to the nature is being collected, stored, transmitted and shared among different organisation. Enormous transaction of these electronic and even exchange and transmit personal and medical information is provided by the Internet. Therefore, it is clear that, specific measures are necessary to ensure that patient medical data can access some authorized person but not everyone. For these purpose, privacy of data and security privacy, it will be necessary to authorized can access the data and according to them perform the task, and the data could be obtained.

Nowadays the problem of security is increased. Especially the privacy of communication through Internet has become more dangerous. Even it attacks in many ways .Online collecting, transmitting, and processing of personal data make up a severe threat to privacy. According to common standards, the network is linked with general practitioners, hospitals, and social centers at a national or international scale. Hence these networks can help to improve the effectiveness of the healthcare system.

Basically intruders include hacker, spies, terrorists, co-intruder, and profession. They use operator commands, macro, and Java Script to break through a computer network with the purpose to steal the confidential information. Even their success depends on some current problems in the whole computer networks, such as errors in network framework design, management negligence, illegal downloading.

2. RELATED WORK AND MOTIVATION

The advancement of healthcare system have made patient monitoring more feasible. Recently several healthcare researches and projects have been implied, which can help to provide continuous patient monitoring. Code-Blue is in-vogue healthcare research project based on developed at Harvard Sensor Network Lab. In this project, many cheap bio-sensors are placed on patient's body. These sensors sense the patient body and transmit it wirelessly to the end-user device for further analysis. The basic idea of the Code-Blue is a doctor or medical professional issues a query for patient health data using their personal digital assistant, which is based on a published and subscribed architecture.

The another healthcare research project named was Alarm-net, which is designed by the university of Virginia. This project is mainly designed for patient health monitoring in the assisted-living and home environment. Alarm-net consist of body sensor networks and environmental sensor networks. Besides, the authors have pointed out some confidential infringement scenarios on Alarm-net, but some security parameter are still pending or we can say that as an address to as a future work.

Meanwhile, another healthcare system was designed by Ng et al, named Ubi Mon was proposed in the department of computing, Imperial College, London. The aim of this project was to address the issues related to usage of wearable and implantable sensors for distributed mobile monitoring. Even Ng et al. proposed and demonstrated the ubiquitous healthcare monitoring architecture, it is widely accepted that without considering the security for wireless healthcare monitoring, which is a paramount requirement of healthcare applications, according to government laws.

All the above projects will enable automatic patient monitoring and provides the potential quality of the healthcare without disturbing patient comfort. Most of the healthcare projects mentioned above addresses the requirement for security and privacy for sensitive data, only a few embed any security.

3 Security Needs in IOT Based Health Care System

Security is one of the most important aspects of any system. People may have different opinion about Security, hence security is defined in several ways. In general, Security is similar to Safety of the System.

A. Identification :

It is one of the most essential requirement in any of the IOT based HealthCare System. In   any of the Health Care system, all the sensor nodes send their data to a co-ordinator. Then the co-ordinator sends the periodic updates of the patient to the server. In this system, it is highly essential to ensure both the identity of the co-ordinator and the server. Identification helps to confirm their identity to each other.

B. Confidentiality :

It is an important equipment in the health Care system. As health Care system contains sensitive information, the storage system must ensure their confidentiality. Moreover only the authorized person should have access the confidential medical records. In case of storage media disposal, the confidentiality of records must be previously stored in such media should be ensured.

C. Integrity :

The storage system must ensure the integrity of the medical records even in the case of malicious insiders.

D. Availability :

It is the most important requirement in health care system. The health care records must be in such a way that it can be accessed at any particular time, Medical records has to be expanded so that the patient may also ask for the correction of the records.

E. Access Control :

Access control is of particular importance when the database storing the composite EHR (Electronic Health Records) is using a DAS (database-as-Service) paradigm, where an organisation's database is stored at an external third-party service provider.

F. Data Privacy :
   Data privacy is considered to be most important issue in healthcare system. It's should not leak the patient information to external or neighbouring networks. In IOT based healthcare system, the sensor nodes collects and forward the sensitive data to the co-ordinator. The main objective of the proposed work is to resolve the security issues existing in the current healthcare system.

Scenario 1: The process of the access control and the authentication mechanism

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Input: Unique ID for the patient and doctor

Output: allow to access medical data

Begin

1. Initialization process
2. μ is the unique id which having p and d has registered user
3. if μ Є p, d
       then login and go to step 4
       else
       firstly patient and doctor go to the administration and need to add some general information
4. system will check whether p, d has to be authorized or not
       if p, d authorized then go to step 5
       otherwise go to step 1
5. after authorization process system will check whether user is patient, doctor or admin
       if patient – can edit/view/update/delete their personal information but she/ he can't able to modify the medical data
       if doctor – can edit/view/update patient medical data accordingly their disease
       if admin – can be edit/view/update/delete all the data
6. End

 Scenario 2: The process of the encryption and decryption

In order to analyze the proposed scheme especially in security, the proposed scheme has compared with the various schemes in terms of other security requirement in the healthcare system. The introduced healthcare system can satisfy all the needs of security in the healthcare system.

In the last, the proposed healthcare system causes less execution time when compared to the existing system, which has great useful for resource sensor device.

5. CONCLUSION

In this paper, we reviewed and analyzed different security requirement which is used in healthcare system. Most of the researched projects about the healthcare system has an issue with the security, they failed to build a stong security service which could help to secure and preserve the patient records. So the main aim of this work is about the fulfillment of security requirement in the healthcare system.

REFERENCES

[1] T Soren Craig, Sudeer Chinta, Mary Eshaghian-Wilner, Nikila Goli, Aman Gupta and Andrew Prajogi,"Securing Pervasive Communications in Healthcare Systems "Journal of Advances in Engineering and Technology, 2016, 3(4): 7-11

[2] Prosanta Gope and Tzonelih Hwang "BSN-Care: A Secure IoT-Based Modern HealthCare System Using Body Sensor Network" IEE SENSORS JOURNAL, VOL, 16, NO.5, MARCH 1, 2016

[3] Alavalapati Goutham Reddy, Ashok Kumar Das, Eun-Jun Yoon, and Kee-Young Yoo "A secure Anonymous Authentication Protocol for Mobile Services on Elliptical Curve Cryptography" IEEE access 2016