CLOUD BASED MEDICAL ASSIST SYSTEM

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Abstract* — There is a noteworthy volume of medicinal services information produced day by day. The information is vital and indispensable for basic leadership and conveying the best consideration for patients. Distributed computing is a savvy strategy that encourages continuous information gathering, information stockpiling and trade between human services associations. Cloud framework is portrayed with a high throughput and a high-volume stockpiling; two essential elements for effective information investigation of substantial patients' populace. Security and protection are of the real worries for utilizing cloud-based human services administrations. Human services association ought to have electronic medicinal records with a specific end goal to utilize the cloud foundation. So as to adapt to the quick progressions in data innovation and the use of cloud-based administrations, endeavours ought to be committed to move medicinal services information frame the conventional paper based to the electronic organization. At that point, local enactment and strategies ought to be authorized to direct and control the utilization of social insurance information.

***Keywords* — Cloud computing; Cloud system; Healthcare organizations; Electronic health records; Security and privacy; Body sensors**

I.INTRODUCTION

Computers play major roles in the healthcare field. Most of the departments of healthcare field have been integrated with the computer technologies for day to day activities. It enables healthcare provider or patient's to easily access the medical information [2]. Electronic Health Record (EHR) is an emerging technology which maintains the entire medical information of a patient. It helps the healthcare provider to know the entire medical information of a patient without any hindrance. It includes information like medication, laboratory test results, status of immunization and personal statistics. Using EHR, the healthcare provider can view the entire medical information of a patient without need to track down the previous medical report. This emerging technology satisfies both the healthcare provider and patients. Accessing EHR stored at the third party such as cloud provider is a great challenge. Obviously EHR store and process very sensitive data and should have a proper security and privacy framework and mechanisms since the disclosure of health data may have severe (social) consequences especially for patients. For example, banks or employers could refuse a loan or a job if the data about the health of a person is available. If health data is leaked outside the system deliberately or accidentally, the responsible health professionals or IT providers would have to face severe legal penalties for violating privacy laws [4]. Patient-centric EHR systems enable patients to selectively access to their health data to healthcare providers and others. An EHR service allows a patient to create, manage and control his/her health information in a centralized place through the web, from anywhere and at any time, which has made the storage, retrieval and sharing of the medical information more efficient [3]. Cloud computing provides a required computing infrastructure for the storage of EHR. However, cloud environment introduces an even greater risk to security and privacy of sensitive data [1]. In this paper, we present a secure patient-centric EHR system where data is stored in a cloud provider. Users store their encrypted data in the cloud provider and provide access to the information according to the user's identity information. The cloud provider will not able to access the data so the privacy and sensitivity of data is guaranteed [1].

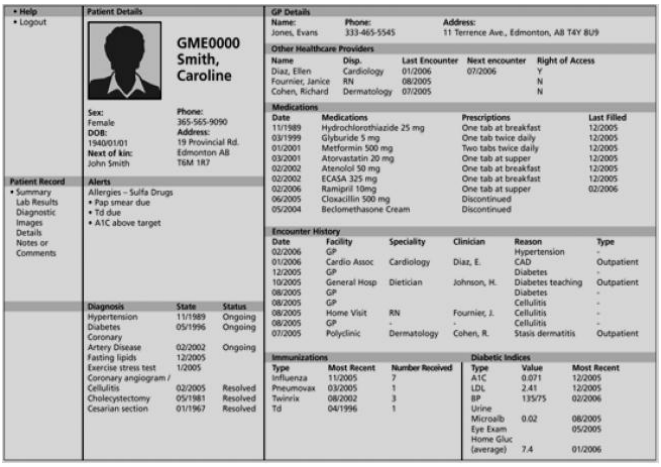

Figure 1. Example for EHR

Figure 1 shows the example for EHR. As a part of proposed work, we are developing EHR management application and deploy it on android devices like smart phones and tablets.

II. RELATED WORKS

A. The Design of Flexible Pervasive Electronic Health Record (PEHR)

The patient's EHR can be accessed electronically, using pervasive storage devices, by authorize healthcare providers at correct time. The storage devices include PDA, mobile phones, laptops and smart cards which are readily available at all times. The flexible pervasive electronic health record system is designed for the seamless access of the patient's EHR. The system was developed after a clinical analysis of data and systematic review of other health information system.

B. Design and Development of Secured M-Healthcare System.

The emerging technology mobile health care system helpsthe patients, researchers and practitioners to access the Electronic Medical Record (EMR) from any location through the mobile phone by accessing the data from the remote database which slacks in giving security. The secure based mobile health care system is designed which includes authentication and access control. Implementation is done using J2ME software and for database oracle is used. Wi-Fi enable mobile phones are used for data and image retrieval. Authentication is provided by secured username and

password in the mobile to access the database in the server system.

C. Scalable and Secure Sharing of Personal Health Records in Cloud Computing Using Attribute-Based Encryption.

Personal Health Record is often outsourced to be stored at a third party such as cloud providers. There is a wide privacy concern as personal health information could be exposed to third party servers and to un authorize parties. A novel patient centric framework is designed for accessing PHRs stored in a semi trusted server. Property Based Encryption (ABE) systems are utilized to encode patient's PHR record. Users in the PHR system is divided in to multiple security domains that greatly reduces the key management complexity for owners and users. The dynamic modification of access policies and file attributes are also provided under emergency condition.

D. Privacy Preserving EHR System Using Attribute Based Infrastructure.

In a distributed computing environment such as cloud computing, secure management of Electronic Health Record where computing resources includes storage provided by a third-party service provider is a challenging task. Attribute based Cryptography is used to construct a secure and privacy preserving EHR system in a cloud. It guarantees the security and privacy of medical data stored in the cloud. Attribute based cryptography and public-key encryption is combined with keyword search to provide privacy preserving electronic health record management system.

E. Securing the E-Health Cloud

Modern information technology is increasingly used in healthcare with the goal to improve medical service and to reduce costs. The outsourcing of computation and storage resources to cloud providers has become very appealing. To overcome this situation, Client platform security solution is provided which combines with network security concepts. The proposed methodology presents security architecture for establishing privacy domains in e-health infrastructures.

III. ARCHITECTURAL COMPONENTS

Cloud benefit models are usually isolated into SaaS, PaaS, and IaaS that shown by a given cloud framework. It's useful to add more structure to the administration display stacks: Fig. 1 shows a cloud reference architecture [5] that makes the most important security-relevant cloud components explicit and provides an abstract overview of cloud computing for security issue analysis.

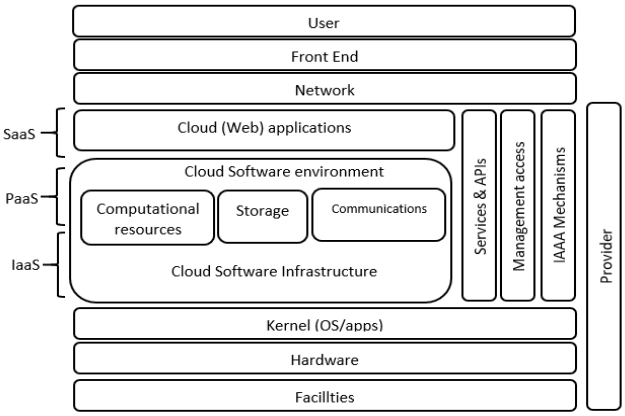

Fig. 2. The cloud reference architecture.

A. Software as a Service (SaaS)

Cloud buyers discharge their applications in a facilitating domain, which can be gotten to through systems from different customers (e.g. Internet browser, PDA, and so on.) by application clients. Cloud shoppers don't have authority over the cloud foundation that regularly utilizes multi-tenure framework engineering, in particular, extraordinary cloud buyers' applications are sorted out in a solitary legitimate condition in the SaaS cloud to accomplish economies of scale and streamlining as far as speed, security, accessibility, catastrophe recuperation and support. Precedents of SaaS incorporate SalesForce.com, Google Mail, Google Docs, etc.

B. Platform as a Service (PaaS)

PaaS is an improvement stage supporting the full "Programming Lifecycle" which permits cloud shoppers to create cloud administrations and applications (e.g. SaaS) straightforwardly on the PaaS cloud. Subsequently, the contrast among SaaS and PaaS is that SaaS just has finished cloud applications though PaaS offers an improvement stage that hosts both finished and in-advance cloud applications. This requires PaaS, notwithstanding supporting application facilitating condition, to have advancement framework including programming condition, devices, arrangement administration, etcetera. An example of PaaS is Google Apennine.

C. Infrastructure as a Service (IaaS)

Cloud shoppers specifically utilize IT foundations (preparing, capacity, systems and other basic registering assets) gave in the IaaS cloud. Virtualization is widely utilized in IaaS cloud with the end goal to incorporate/break down physical assets in an impromptu way to meet developing or contracting asset request from cloud purchasers. The essential methodology of virtualization is to set up free virtual machines (VM) that are secluded from both the hidden equipment and different VMs. Notice that this technique is not the same as the multi-occupancy display, which means to change the application programming design with the goal that various occasions (from numerous cloud shoppers) can

keep running on a solitary application (i.e. a similar rationale machine). A case of IaaS is Amazon's EC2.

D. Data as a Service (DaaS)

The conveyance of virtualized stockpiling on interest turns into a different Cloud benefit - information stockpiling administration. Notice that DaaS could be viewed as an uncommon kind IaaS. The inspiration is that on-introduce undertaking database frameworks are regularly tied in a restrictive forthright expense in committed server, programming permit, post-conveyance administrations and in-house IT upkeep. DaaS enables customers to pay for what they are really utilizing instead of the site permit for the whole database. Notwithstanding conventional capacity interfaces, for example, RDBMS and record frameworks, some DaaS contributions give table-style reflections that are intended to scale out to store and recover a colossal measure of information inside an extremely compacted timeframe, often too substantial, excessively costly or too moderate for most business RDBMS to adapt to. Precedents of this kind of DaaS incorporate Amazon S3, Google Bigtable, and Apache HBase, and so forth

IV. APPLICATIONS

These are some of the cloud computing applications [6] as follows:

- Cloud computing provides dependable and secure data storage centre.
- Cloud computing can realize data sharing between different equipment's.
- The cloud gives about unbounded probability to clients to utilize the web.
- Distributed computing does not require top notch gear for the client and it is anything but difficult to utilize.

V. ISSUES IN CLOUD COMPUTING

More data on people and organizations is put in the cloud; concerns are starting to develop about exactly how safe a domain it is? Issues of cloud computing [3] can analysed as follows:

A. Privacy

Cloud computing utilizes the virtual computing technology, users' personal data may be scattered in various virtual data centre's rather than stay in the same physical location, users may leak hidden information when they are accessed cloud computing services. Attackers can analyse the critical task depend on the computing task submitted by the users.

B. Reliability

The cloud servers likewise encounter downtimes and lulls as our neighbourhood server.

C. Legal Issues

Stresses stay with security measures and privacy of individual completely through administrative levels.

D. Compliance

Various controls relate to the capacity and utilization of information requires standard detailing and review trails. In addition to the requirements to which customers are subject, the data centre's maintained by cloud providers may also be subject to compliance requirements.

E. *Freedom*

Distributed computing does not enable clients to physically have the capacity of the information, leaving the information stockpiling and control in the hands of cloud suppliers.

VI. CLOUD COMPUTING IN MEDICAL SYSTEM

Fig 3: cloud connected to various devices

Cloud Computing provides us freedom to access data from anywhere by using various devices. As in Medical assist system data is access by various centre's or clients so it is beneficial to use cloud computing so that only one database is maintained and accessed. This saves the space and if the data is updated then data remains same for everyone.

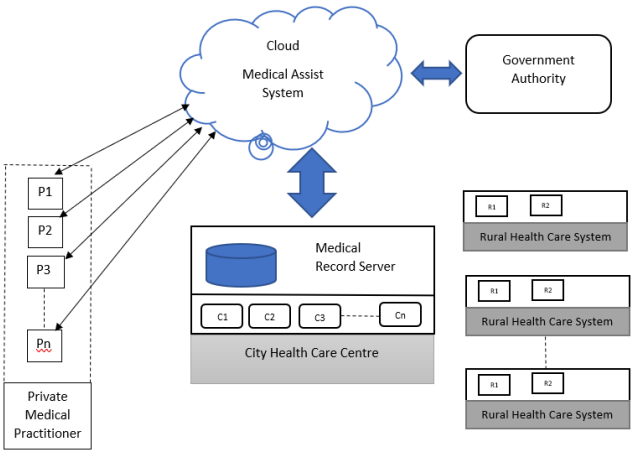

Fig 4: cloud computing in medical assist system

VII. NEED FOR CLOUD COMPUTING IN MEDICAL ASSIST SYSTEM

The need for Cloud computing arises in the fact that approximately 70% of medical assist systems in the United States fail to "communicate" with other software. This means that even though a hospital or clinic may be connected to the Cloud, the data storage method may be incompatible with another hospital's system and is therefore rendered virtually inaccessible to outside sources. The ability for systems to communicate, called interoperability, is one of the hottest topics for new and revolutionary Cloud medical assist system.

VIII. CONCLUSION

From above content, we can say that cloud computing is better option for medical data storage as it provides freedom to access the data from a single database which is more efficient. Using this system, we can provide proper medical assistance to patients, there also drawbacks of system. The risks of security such as Data Confidentiality, Write Access Control, Scalability, efficiency and usability are managed. Efforts are being taken to deploy this EHR management application on android devices like smart phones and tablets.

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