International Journal of Emerging Technologies in Engineering Research (IJETER)
Volume 4, Issue 5, May (2016) www.ijeter.everscience.org

Big Data Health Care Monitoring

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Abstract – Context aware monitoring is a technology which providers personalized health care services. The large amount of data generated is stored in cloud repositories. Cloud means accessing data from a remote machine. We can access the data anywhere form the world of we store it in cloud. The data will be encrypted and then stored in cloud, as they data's of patients are very sensitive. The patients will be provided with the key to decrypt the data and see the details. We use this to identify patient's abnormal conditions in the sugar heart rate (HR) and blood pressure (BP) level.We also use big data in our project. There are three type of format: structured,un-structured and semi structured. In this paper we are using un-structured format.

Index Terms – Cloud, sugar heart rate and blood pressure.

1. INTRODUCTION

Ambient assisted living (AAL) system consists of heterogeneous sensors and devices that generates huge amount of unstructured raw data. Due to variety of sensors and devices the captured data also have more variation. A data element can be from few bytes to gigabytes. There are also huge amounts, disease histories and social contacts. If we want to store all these data and patient histories to predict any future abnormality accurately then the representation data will be very large. To handle such concerns it is necessary to implement cloud-based assisted healthcare.To process the large amount of medical data, ambient and media data using computational power, extraction right context information finding the correlation between different context, are primary challenge in the development of context aware monitoring according to IBM, big data can be characterized in four v'sVolumeVarietyVelocity Veracity.Our model also satisfies these four v's. Traditional solution for personalized AAL system depends on standalone application.An important feature of remote monitoring application is to identify the abnormal condition of a patient and to send them alerts to the care givers. In our model context means any high level user specification obtained from raw sensor data are sent to a monitoring center for decision making about the patient condition can wear the patient by activating a local device or send an emergency message to the monitoring center.

2. MODULES DETAILS

2.1. Authentication And Authorization

In this module the data collector have to register first,then only he/she has to access the data base. After registration the data collector can login to the site, the authorization and authentication process facilitates the system to protect itself and besides it protects the whole mechanism from unauthorized usage. The registration involves in getting the details of the users who wants to use this application

2.2. Patient Report Store To Cloud

In this module data collector upload the report in cloud repositories and stored in the local system the report (ECG,HR,BP) store to the real cloud storage (in this application we use drop box). While uploading unstructured raw data everyday due to diversity of sensors and devices the captured data also have wide variations. A data element can be from a few bytes of numerical value(e.g HR=72 bpm) to several gigabytes of video stream.

2.3. Patient Profile And Appointment

You can make appointment with a particular patient by clicking the add appointment button from any page of their patient profile. Select the date and time of the potential appointment and select the practitioner and location from the dropdown menu. Choose the fee in order to set the duration. If the appointment time is available, a green available message appears; if the appointment time is not available, select a different appointment time. Click the save button the appointment to the calendar and then add other information to the appointment where require.

2.4. Analysis Big data In Cloud

A number of use cases in healthcare are well suited for a big data solution. Some academic or research-focused healthcare are either experimenting with big data or using it in advanced research project. Those institutions draw upon data scientists, statisticians, graduate students and the like to wrangle the complexities of big data, in the following sections, we'll address some of those complexities and what's being done to simplify big data in healthcare is being used to predict epidemics, cure disease, improve quality of life and avoids preventable deaths. With the world's population increasing and everyone living longer, models of treatment delivery are rapidly changing and many of the decisions behind those changes are being driven by data. The drive now is to understand as much about a patient as possible, as early in their life as possible-hopefully picking up warning signs of serious illness at an early enough stage that treatment is far more simple (and less expensive) then if it had not been spotted until later.

2.5. Generate Report And Send Emergency Alert

Now a day healthcare industry is growing enormously due to the increase in elderly population and decline in birthrate. A healthcare becomes a big issue due to lack of availability of expert doctors. Due to this issue there is a paradigm shift from need based health monitoring to preventive health monitoring service. Keeping in view this scenario we are proposing a health care system which will be integrated with cloud computing. That will make system capable of generating EMR i.e Electronic medical records of patients which will play a beneficial role for patient's diagnostic and rapid improvement process as well as for medical practicing doctors who need vast medical cases for their own study purpose. This system will keep track of patient's health in a timely manner and generate a alert when the patient's vital parameters crosses the normal value. The major data will be transferred to the cloud storage that can be accessed by registered expert doctors and patient.

3. SYSTEM ARCHITECTURE

4. AES ALGORITHM

Base Structure of AES Algorithm

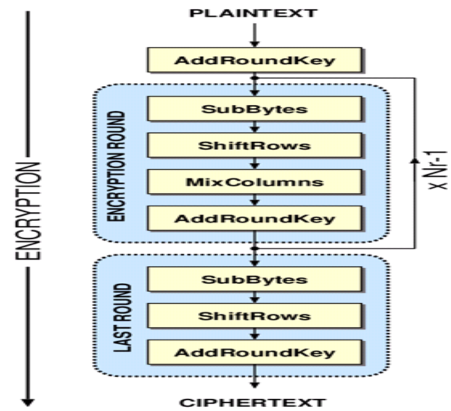
Rounds Nr= 6+max{Nb,Nk}

Nb=32-bit words in the block

Nk=32- bit words in key

AES-18:10,AES-192:12

AES-256:14



4.1. Substitute Bytes:

Each byte is replaced by byte indexed by row (left 4-bits0 & column (right 4-bits) of a 16x16 table.

EA	04	65	85
83	45	5D	96
5C	33	98	B0
F0	2D	AD	C5

87	F2	4D	97
EC	6E	4C	90
4A	C3	46	E7
8C	D8	95	A6

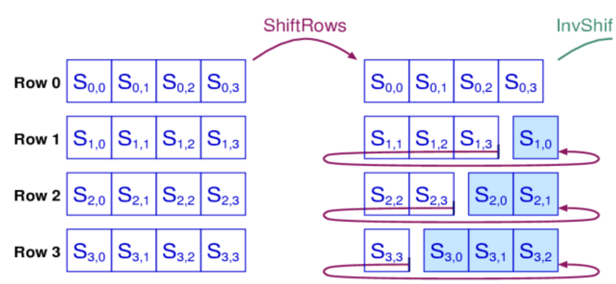
4.2. Shiftrows

1st row is unchanged

2nd row does 1 byte circular shift to left

3rd row does 2 byte circular shift to left

4th row does 3 byte circular shift to left



4.3. Mixcolumns

Effectively a matrix multiplication in GF(28) using prime polynomia M(x)=x8+x4+x3+x+1

87	F2	4D	97
6E	4C	90	EC
46	E7	4A	C3
A6	8C	D8	95

>

47	40	A3	4C
37	D4	70	9F
94	E4	3A	42
ED	A5	A6	BC

({02} *{87}) + ({03} * {6E}) + {46}   + {A6} = {47}

4.4. Add Round Key

XOR state with 128-bits of the round key

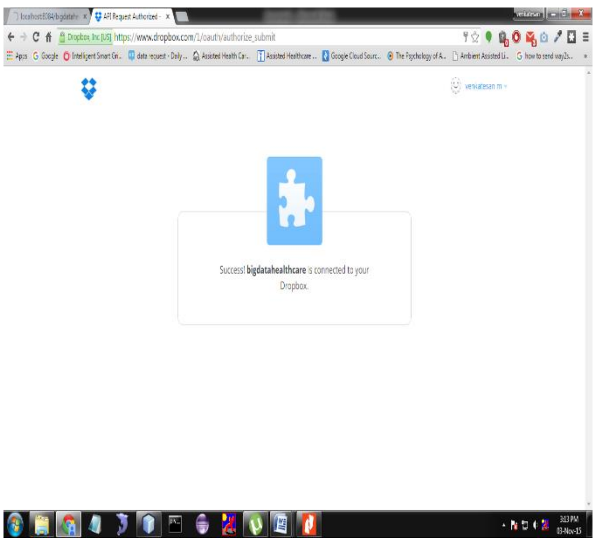
4.5. AES Decryption:

AES decryption is not identical to encryption but each step has an inverse.

5. RESULT

In the existing system Context aware monitoring system monitorspatient's data second by second and stored in cloud repositories. It cannot handle lager amount of data and the accuracy and efficiency is also very less. It also has limited storage space. But in our proposed system we are using big data inside the cloud environment. The proposed system monitor the patients data second by second and send it to patient if there is any abnormality in the data such as BP, sugaretc., in this technology the accuracy and efficiently is more and no storage limitation.

Upload success in cloud



6. CONCLUSION

In this work, we have presented BDHCaM, a generalized framework for personalized healthcare, which leverages the advantages of context-aware computing, remote-monitoring, cloud computing, machine learning and big data. Our solution provides a systematic approach to support the fast-growing communities of people with chronic illness who live alone and require assisted care. The model also simplifies the tasks of healthcare professionals by not swamping them with false alerts. The system can accurately distinguish emergencies from normal conditions. The data used to validate the model are obtained via artificial data generation based on data derived from real patients, preserving the correlation of a patient's vital signs with different activities and symptoms. The stronger relationship between vital signs and contextual information will make the generated data more consistent and the model will be more accurate for validation. The experimental evaluation of our system in cloud model for patients having different HR and BP levels has demonstrated that the system can predict correct abnormal conditions in a patient with great accuracy and within a short time when it is properly trained with large samples. In future, we intend to extend the model with more context domains.

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