A CLOUD-STORAGE RFID LOCATION DETECTION SYSTEM

[1] Ms. A A. Jaisingpure, [2]Dr.Mrs. S. S. Sherekar, [3]Dr.V.M.Thakare

[1]Student ME , [2]Professor, [3],Professor

[1] PG Department of Computer Science & Engineering,
[1]SGBAU, Amravati, India

Abstract : A radio-frequency identification (RFID) technology is an automatic identification method by using cloud storage i.e. storing the data and retrieving the data. The cloud-storage RFID location detection system is an process of detecting the tag ID form the users. This technology is based on radio-frequency identification as well as Wireless sensor network. This paper is focused on different five techniques such as, location tracking system, detection of cloning attacks by using RFID system, trauma resuscitation, chipless RFID tag detection, and smart phone absence alert system is based on RFID. But there are some problems in these methods. These problems to overcome are given in analysis and discussion. To overcome these problems, the paper proposes a new system to produce a cloud storage RFID location detection system, so as to reduce the existing problem and detect the tag ID i.e. easy access to the end users.

IndexTerms - **Cloud-Storage, RFID, Detection System.**

I. INTRODUCTION

A radio-frequency identification (RFID) tag detection then detect the tag ID, these technologies are also used for security purpose, and easy access to the user i.e. users can access the cloud services are available for the browser, a web application, and a cell phone application. This technology is based on radio-frequency identification as well as Wireless sensor networks. The location detection system by generated the frequency signals, and decode the tag ID. This paper focused on different five techniques such as, Location tracking system, [1] for the purpose of this system achieving rapid and complete functions, a large amount of RFID and WSN hardware is required. It is also used for a variety of services, such as network services, social networking, goods tracing services, highway toll queries, health care, and etc [1]. Deterministic detection of cloning attack scheme, are seriously impede the security of radio-frequency identification (RFID) applications. The Tag Cloning attacks stand in the way of secure radio-frequency identification (RFID) applications [2]. Trauma resuscitation use detection system is based on RFID technology for detecting the use of objects and other activities during trauma resuscitation. This system provides feedback to improve the efficiency and effectiveness [3]. Chipless RFID tag detection system using adaptive wavelet is based on detection algorithm. This system measured using the vector network analyzer. The chipless RFID tag the detection algorithms and decoding techniques when the chipless RFID tag is in motion [4]. The Smartphone absence alert system based on RFID This system consists of a low-power RFID Reader interfaced with smart phone and a passive RFID tag attached to the users [5].These techniques to reduce the some problems and detect them whenever as possible. But there are some problems in this method.

This paper present, RFID based a cloud storage location detection system where method is applied for the decoding the tag ID in reader, fixed location by moving reader to provide the correct location for tracking as well as detecting tag ID, and stored the data in database. The cloud- storage RFID location detection system, location tracking and detection algorithm are used in this system.

II.   BACKGROUND

A radio- frequency identification technology is used for many areas in last few years, ensuring that maintaining the security, high localization, cost, and so on. Location detection systems are also used for location identification and detect the tag ID, then located frequency signals are generated in RFID. The methods and techniques used are: "A cloud storage RFID location tracking system" for tracking the object in cloud localization algorithm (CLA), and collected the data in specific objects [1]. In proposed deterministic detection of clone attack for anonymous RFID system without tag IDs, there are three protocol used for BASE, DeClone, Declone+ protocols are scalable; clone tag is the application of RFID used for validate the authenticity of tagged objects [2]. In the proposed scheme, passive RFID for object and use detection during trauma resuscitation RFID tags and antennas, optimally placed for object detection as well as algorithm for processing RFID data to infer object use [3]. In proposed "Adaptive wavelet based detection algorithm" is used for the decoding of the tag ID, moving chip less RFID technology are used for many area including health monitoring, animal identification, and so on [4]. In proposed "An RFID based smart phone absence alert system" is work on automatic, timed, or accelerometer based thresholds. The smart phone alert system is main purpose of security, and audio-visual alert in owner [5].

The paper is organized as follows:

Section I Introduction. **Section II** discusses Background. **Section III** discusses previous work. **Section IV** discusses existing methodologies. **Section V** discusses attributes and parameters and how these are affected on mobility models. **Section VI** proposed method and outcome of result. Finally **Section VII** Conclude this analytical paper.

III.　　PREVIOUS WORK DONE

Yeong-Lin Lai *et al*. (2014) [1] proposed scheme, a cloud computing technology is applied a location tracking system so as to improve the calculation speeds and reduce the hardware costs. A cloud-storage RFID location tracking system are integrating cloud computing, database systems, and personal homepage program (PHP) or cascading style sheets (CSS) language technologies used for data processing and recording to reduce the hardware requirements of the system. The cloud-storage RFID location tracking system using a network node communication technique provided real-time localization.

Shigeng Zhang *et al*. (2015) [2] proposed detection of cloning attacks for anonymous RFID systems such method work for RFID operations with tag IDs as a must, e.g., tagged-object information query over the Internet in an EPCglobal network. This system, are desirable to lower cost tag and gain efficiency in large system. Tag IDs, however, should be protected to enable and secure privacy-sensitive applications in anonymous RFID systems.

Siddika Parlak *et al*. (2016) [3] proposed method for a trauma resuscitation for detecting the object use in passive RFID. Trauma resuscitation the initial management of critically injured patients in the trauma bay application used in hospital, and passive RFID tags do not require maintenance because they operate without batteries. Near field RFID readers used for achieving robust tag detection system.

Meriam Anushani Bibile *et al*. (2018) [4] proposed scheme, a moving chipless RFID (Radio Frequency Identification) based on adaptive wavelet detection algorithm. This system measured using the vector network analyzer, and moving average technique is a simple denoising technique, which removes noises by acting as a low-pass filter. This work is highly useful for automatic identification and authentication.

Muhammad Jawad Hussain *et al*. (2017) [5] proposed method a smart phone absence alert system is based RFID. This system, relies to take the security measures at the very instance a mobile phone is lost. This system consists of a low-power RFID Reader interfaced with smart phone and a passive RFID tag attached to end user The RFID-based system is more economical budget.

IV.　　EXISTING METHODOLOGIES

1.　A Cloud-Storage RFID Location Tracking System:

A Location Tracking System is based on cloud storage (RFID) radio frequency identification scheme are used for tracking the object, and a cloud computing technology are applied for improve the calculation speed and hardware cost is low. This system used the signal attenuation model (SAM) in a nonopen space, received signal strength indicator (RSSI), link quality indicator (LQI), and cloud localization algorithm (CLA) for object tracking [1]. The distance between the object and the reader, D, is calculated by

$$D = \left[DN - \frac{(DN - DN{+}1)\,(RN{+}1 - R)}{(RN - RN{+}1)} \right] \times RCal$$

$$RCal = \frac{Rref}{RN}$$

Where, DN stands for the distance from the reader at Nth location and RN stand for the RSSI at *N*th location. R and Rref represent the RSSI values of the object and the reference tag, respectively. RCal is the ratio of Rref to RN.

2.　Deterministic Detection of Cloning Attacks:

A Deterministic Detection of Cloning Attacks for Anonymous RFID System use for tag cloning attacks in the way of secure radio frequency identification (RFID) applications. This system, proposed three protocol are used- BASE, DeClone, and DeClone+ toward fast and deterministic clone detection for large anonymous RFID systems [2]. DeClone can successfully detect the cloning attack are given by:

$$Pr = 1 - \sum_{j=0}^{f} Pr_{(N_1 = j \mid n, f)} \left(1 - \frac{j}{f}\right)^{m}$$

$$= 1 - \sum_{j=0}^{f} \binom{f}{j} Pr_{(n,f)}^{j} \left(1 - Pr_{(n,f)}\right)^{f-j} \left(1 - \frac{j}{f}\right)^{m}.$$

Where, Pr denote the probability of Declone, Pr $_{(n.f)}$ stand for the probability of a slot.

3. Use Detection during Trauma Resuscitation scheme:

The Trauma Resuscitation is an passive RFID for object and activities during trauma resuscitation. This system consists of RFID tags and antennas, optimally placed for object detection, and then analyzed the RFID data to identify cues. This system, are automatically recognizes human activities in real time and provides feedback to improve the efficiency and effectiveness of time-critical medical work, such as trauma resuscitation. Trauma resuscitation is the initial management of critically injured patients in the trauma bay [3]. To estimate the probability of patient survival are given by:

Penetrating trauma: Logit = -2.5355 + $RTS \times 0.9934 + ISS \times 0.0651$ + (Age points) $\times 1.1360$, B) Where, RTS stand for the revised trauma score is a physiologic evaluation, ISS stand for measuring the trauma severity.

4. Moving Chipless RFID Tag Detection Scheme:

The Moving Chipless RFID Tag Detection by using adaptive wavelet based detection algorithm are used for tag in stepped motion [4] This system used the signal space representation of chipless RFID tags uses an efficient mathematical model to decode information in a chipless RFID tag. A maximum likelihood (ML)-based tag detection technique and a trellis decoding technique has been developed where detection error rate (DER) is compared with the bit to bit detection [4]. A detection algorithm using the energy detection.The DER is given by:

$$DER = 1 - \text{throughput}$$
$$\text{throughput} = \frac{N_s}{N_T}$$

Where, N_s indicate the number of successful tag detections, N_T stand for the total number of tag readings.

5. Smartphone Proximity Absence Alert System

The Smartphone Proximity Absence Alert System based on radio frequency identification (RFID). The lost and stolen mobile phones amount to 30$ billion where as 1.6 million people lost their mobile phones [5]. RFID schemes as anti-lost solution the relevant UHF RFID systems, a campus security system is demonstrated in based upon RFID and Zig-bee [5]. The tag mobile uses active and passive tags for location and tracking. The tag in safety measure alerting the owner through the specific audio, and blinks its screen.as well as sending the SMS, locking the phone, and so on. The threshold P is given by :

$$D_{avg}(t) = \frac{1}{N}\sum_{i=1}^{N}\|d_t\| = \frac{1}{N}\sum_{i=1}^{N}\sum_{t=1}^{T}\left(\sqrt{x_t^2 + y_t^2 + z_t^2}\right)$$

Where, T stands for sampling time, $D_t = (x_t, y_t, z_t)$ stand for the accelerometer readings to measure the euclidean length.

V. ANALYSIS AND DISCUSSION

This method which is based on RFID reader tag is tracking the location in cloud storage. This method also refers hat reference tag layer provides real-time calibration to reduce the localization error due to environment. The localization error of the cloud-storage RFID location tracking system was controlled to within 1 m [1].

`The Cloning Attacks schemes are used for three protocols -BASE, Declone, and Declone+. Clone tags cause a contradiction between tag cardinality and ID cardinality. BASE, however, catches cardinality contradiction until most tags respond in singleton slots. Declone, are unreconciled collision detection through re-arbitrating collisions using slotted Aloha. Declone+ is built on Declone [2].

The Trauma Resuscitation schemes are used for medical team by using trauma bay. Medical expert are judged critical for the performance of trauma resuscitation. The long-range passive RFID, are able to identify the exact instance of a used object type .The object instance detection is similar to that of medication and blood tracking, however, the short-range technologies, require user participation in the sensing process [3].

The Chipless RFID Tag detection schemes are the variation of magnitude and frequency due to the movement of a chipless RFID tag. The variation in the magnitude of S11 while the chipless RFID tag is in motion, the amplitude gradually changes and a small frequency shift is also visible. The magnitude variation is more significant in this direction [4].

The Smartphone absences alert system methods are use the variability of the received power reflected by the tag, in presence of obstacles and other people under various factors like multipath, body shadowing and non-coherent receiver design. The light-weight on cell phone battery once compared with onboard sensors like accelerometer, camera, micro phone and communication interfaces like GPS [5].

TABLE 1: Comparison of different techniques

Proposed schemes and techniques	Advantages	Disadvantages
Location Tracking System based on cloud storage RFID	It has been widely used for network services, social networking, goods tracing services, highway toll queries, health care and etc.	Doesn't work properly on liquid and metal product.
Deterministic Detection of Cloning Attacks	Accuracy, Anonymity, Scalability of this system	A clone could create a black hole, and simply leak data.
Trauma Resuscitation scheme	Passive RFID tags are also smaller and cheaper	They require human participation, which is intrusive in real-world applications.
Chipless RFID Tag Detection	Environmental robustness of this system.	Lesser Identification capability, Low efficiency.
Smartphone Absence Alert System	RFID tag and reader should not be in LOS to make the system works; It provides location to the reader along with its ID.	RFID devices need to be programmed which requires enough amount of time.

VI. PROPOSED METHODOLOGY

A new robust system is a cloud storage RFID location detection system. An RFID system consists of either two or three components, a transponder and a reader and in a third component of the system also includes software which processes the information stored in database. A location detection system are use in location decoding the IDs is an particular object, and set the location detected then readers information stored in database as well as frequency signals are produce. The reader consists of a transmitter and a radio receiver, a control and a connection to a database. The transponder, also called tag, in turn, consists of an antenna, a microchip, and so on. This system proposed scheme, radio frequency identification (RFID) is an automatic identification technology as well as use for wireless or wired technologies. A cloud storage RFID location detection system is detecting tag ID for tracking the object. In these schemes that are every data or information are stored in database. In this method is applied for the location detection system (LDS) decoding the tag ID in reader. This system is very easy access to end users or customize, and the main advantage of this system is hardware cost it reduce, it is very easy to implementing in any areas, localization error has been reduce, compatible with the system. This system proposed detection of RFID device in known, fixed location by moving reader to provide the correct indication of location tracking and detected tag ID the object or moving object that carrying the reader. The system, operates by the reader emits a radio signals. the reader, which is transferred into a readable format and updates the data into the cloud database through the internet. The algorithm used for location detection system.
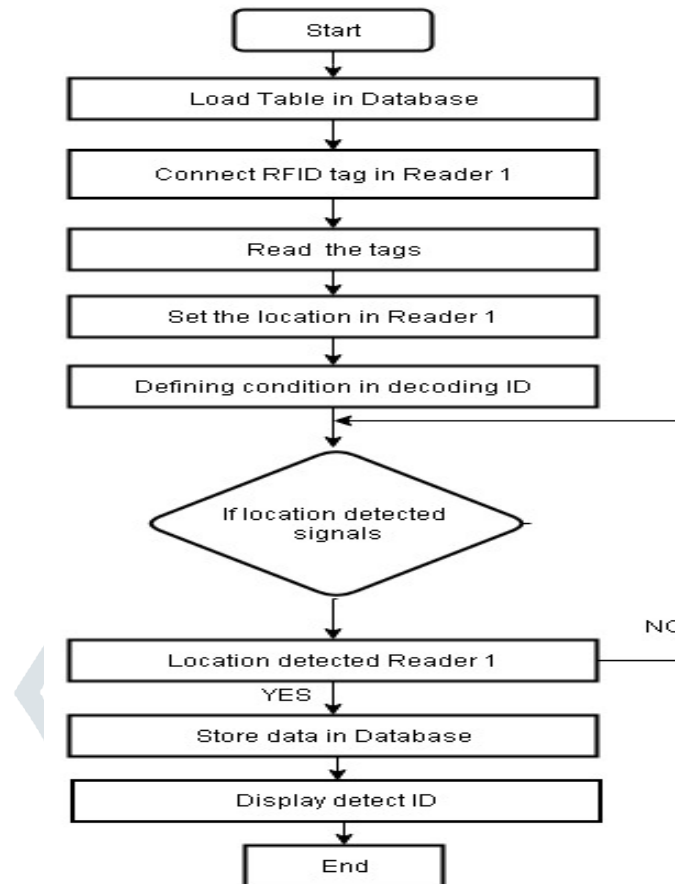
FIGURE 1: Flowchart of Proposed Methodology

VII. OUTCOMES AND POSSIBLE RESULT

Location detention system is detects tag ID are automatically identification is based on cloud storage RFID (Radio Frequency Identification). To ensure that good signals produce, coverage ratio, the reader sent data to the cloud server via a wireless network that are information store in database. This system, user can access the cloud services are used in various applications like a desktop application, a browser, as well as android phone are easily accessible to end user. To improve accuracy and reduce the hardware cost in the system.

VIII. CONCLUSION

This paper is focused on five different techniques such as location detection system by using RFID based on cloud storage location tracking system, trauma resuscitation, moving chipless RFID adaptive wavelet algorithm, cloning attack and Smart phone absence alert system. But there are some problems in each method. This proposed method will help to solve the problems related to location detection system i.e., decode tag ID in reader, better accuracy for the user and at a low hardware cost. These systems are used in many areas like hospital, nusering home, school and so on.

IX. FUTURE SCOPE

From observations of the proposed method the future work will include the implementation of the location detection system using RFID based on cloud storage. The system will result in detecting the ID to end user using android phone applications, desktop application and Internet as well as cloud computing

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