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MISSING TAG DETECTION WITH RFID TRAFFIC MANAGEMENT

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Abstract—

The most important applications of radio frequency identification (RFID) technology is to detect the missing tag. Missing tag detection problem is arising in multiple-group, multiple-region in radio frequency identification (RFID) systems. Traffic management is the better understanding for performing operation in missing tag detection. This paper focuses on analysis of different five techniques and application such as On missing tag detection, Piece-wise constant models for RFID traffic, Enhanced RFID tag detection accuracy, Efficient unknown tag detection in large-scale RFID systems and Distance bounding. But there are some issues to address in these methods. These issues are discussed in analysis and discussion. To overcome these problems, the paper proposes modified approach to detect the missing tag with RFID traffic management system.

Keywords— Missing tag, RFID, detection system, traffic control.

Introduction

One of the most important applications of radio frequency identification (RFID) technology is used to detection in missing tag. Missing tag detection problem is arising in multiple- group, a multiple-region in radio frequency identification (RFID) systems. Traffic is urban areas is increasing day by day which leads to most critical issues of traffic management. Traffic management causes loss of time, time delayed, etc. This paper focused on analysis of different five techniques. In missing tag detection, [1] the problems are tackle is to devise missing tag detection protocols with minimum execution time while guaranteeing the detection reliability requirement for each group; by leveraging the techniques of Bloom filter [1]. In piece-wise constant models for RFID traffic, [2] the adaptation of two known piece-wise linear models for the purposes of modeling RFID command arrivals at a reader: Bayesian Blocks and Knuth's rule [2]. In enhanced RFID tag detection accuracy, [3], Enhanced RFID tag detection accuracy using Phase diversity in a Distributed Antenna System (DAS) has also been shown to improve performance by multicasting the same signal to several distributed antennas, and temporally varying the phase of the signal fed into each antenna [3]. In efficient unknown tag detection in large-scale RFID systems, [4], the system propose of a fast and reliable method for probabilistic unknown tag detection, white paper (WP) protocol; Accurate and fast unknown tag detection is very important to many applications [4]. In distance bounding, [5], the use of secure neighbor detection (SND) method has therefore become important in wireless network environments [5]. But there are some issues in these methods. These problems to overcome are discussed in analysis and discussion.

This paper presents, radio frequency identification (RFID) authentication plays an important role in detection and verification of the users information so that the proposed method will implemented with evaluation and authentication of the RFID tag data with missing tag detection algorithm with encryption

indexing process in which the pattern evaluation and matching also consider for the evaluation. So that proposed methodology will make the system fast, secured and reliable.

BACKGROUND

Radio frequency identification (RFID) technologies used in many areas in few years, e.g., Inventory management, Traffic management, security and so on. Detect the missing tag with RFID in traffic management systems. The techniques and application used are: On missing tag detection missing tag detection algorithms in the multiple region multiple-group case, [1] the leverage a powerful technique called Bloom filters which is a space-efficient probabilistic data structure for representing a set and supporting set membership queries to detect a missing event [1].

In the proposed scheme, "Piece-wise constants models for RFID traffic" application used for piece-wise linear models for the purposes of traffic characterization in RFID networks [2].Modeling of the communication within RFID networks can lead to a better understanding of their operation under "normal" system state conditions [2].

In proposed enhanced RFID tag detection accuracy the use of phased array antennas in both the uplink and downlink are also reported to increase tag read range, as the spatial selectivity of phased arrays allows multiple paths to be minimized or altered [3].

In the proposed scheme, **"**efficient unknown tag detection in large-scale RFID systems with unreliable channels" is to detect unknown tag brought by new tagged items, misplacement, or counterfeit tag; the probabilistic unknown tag detection, white paper (WP) protocol [4].

In proposed distance bounding used for security of industrial applications. Distance bounding determines an upper bound for the physical distance between two communicating parties based on the round-trip time (RTT) of cryptographic challenge-response pairs, thereby cryptographically verifying the physical proximity of two devices [5].

PREVIOUS WORK DONE

Jihong Yu *et al.* (2017) [1] proposed scheme, a missing tag detection problem arising in multiple-group, multiple-region radio frequency identification (RFID) systems, As a promising low-cost technology, RFID is widely used in various applications ranging from inventory control, supply chain management and logistics to object tracking and location.

Zornitza Genova Prodanoff *et.al* (2016) [2] proposed method the adaptation of two known piece-wise linear models for the purposes of modeling RFID command arrivals at a reader: Bayesian Blocks and Knuth's rule. NFC security already addressed in the context of specific applications. NFC-based mobile payment system also developed over the existing GSM infrastructure.

Michael J. Crisp *et.al* (2016) [3] proposed distributed system of phased array antennas interrogating RFID tags over a wide area, making use of a combination beam steering and phase diversity between the arrays to increase performance, when compared to a system of fixed antennas.

Wei Gong et.al (2017) [4] proposed There are two problems to unknown tag detection (UTD) is unknown tag identification (UTI). Despite their similarity, both two problems are different and have their own characteristics.

Adnan Abu-Mahfouz et.al (2013) [5] proposed for estimating the distance between devices, but these are not necessarily designed to be secure. Time-of-flight (ToF) and received signal strength (RSS) are often used for distance estimation between two nodes.

EXISTING METHODOLOGY

1. On Missing Tag Detection in RFID System

A missing tag detection problem arising in multiple-group, multiple-region radio frequency identification (RFID) systems, where as mobile reader needs to detect whether there is any missing event for each group of tags. The execution time is calculated by T_B

$$T_B = R(t_1 + f\delta) \simeq Rf\delta,$$

Where, t1 denotes the time for the reader to broadcast the query parameters and d denotes the slot duration.

2. Piece-Wise Constant Models For RFID Traffic

The ultra-high frequency RFID tags and a reader has been adequately solved by standardization efforts through the development of latest lightweight cryptography standards. The modeling RFID command arrivals at a reader: Bayesian Blocks and Knuth's rule. Bayes Theorem is apply for

$$p(\lambda|DM)p(D|M) = p(D|\lambda M)p(\lambda|M),$$

Where, D is raw data, M is the model of the data, p (D/M) is the Bayesian evidence for the data, the meaning of behind the "|" is "given the model".

3. Enhanced RFID tag detection accuracy

Enhanced RFID tag detection accuracy with distributed antennas array in frequency diversity are also applied to the problem over the entire 860-960 MHz band, but has been shown to be insufficient in the narrow 2 MHz ETSI band allocated for RFID. A beam is generated using equal amplitude and uniform progressive phase in calculated by

$$F(\theta,\phi) = \sum_{n=0}^{N-1}\sum_{m=0}^{M-1} E(\theta,\phi)e^{jkd(n\psi_x+m\psi_y)}$$

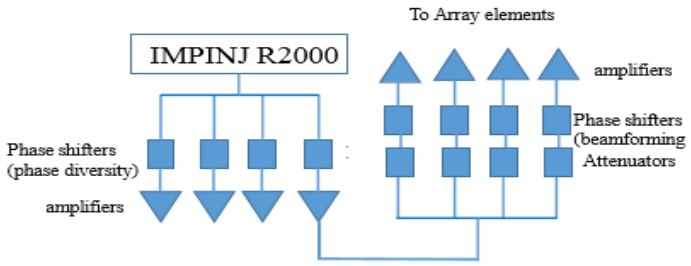


Figure 1

Architecture of Distributed Antenna Array RFID system showing reader architecture with all of its output ports connected to the feed into the array in fig 1

4. Efficient unknown tag detection in large-scale RFID systems

Efficient unknown tag identification is able to pinpoint all the unknown tags, probabilistic unknown tag detection is preferred in large-scale RFID systems that need to be frequently checked up, e.g., real-time inventory monitoring. The RFID system consists of three parts: tags, a reader, and a back-end server; the reader first broadcasts to tags a probing message.

$$Sn = H (f, r, ID)$$

Where, ID is the unique identification information.

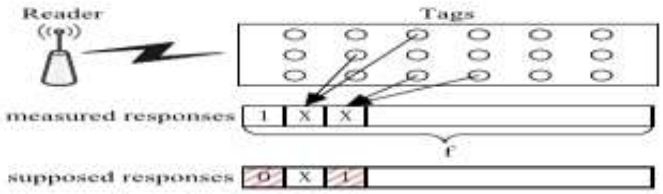


Figure 2

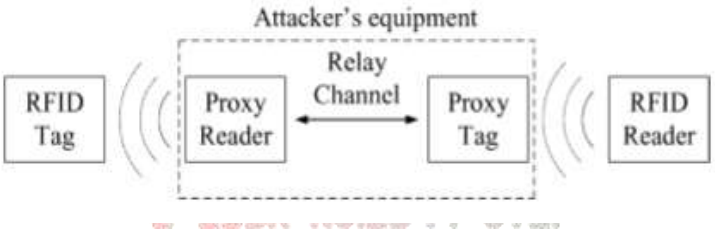
The ALOHA model and basic detection scheme in fig 2.

5. Distance Bounding

Distance bounding are supply chain and item tracking using radio frequency identification (RFID) technology and related real-time location (RTLS) system. Distance bounding determines an upper bound for the physical distance between two communicating parties based on the round-trip time (RTT). The distance between two devices can be calculated as

$$d = c. t_p$$

Where, c is the propagation speed and t_p is the one-way propagation time between the transmitter and the receiver. Mafia fraud (relay attack) in RFID asset tracking system



Flow diagram 3: RFID asset tracking system

ANALYSIS AND DISCUSSION

On missing tag detection RFID systems are used in multiple-group, multiple- region. Then the mobile reader is to detect any missing event for each group of tags. This method is used for Bloom filter; Bloom filter use for the decreasing the execution time compared to its predecessor [1].

Piece-wise linear constant model for RFID traffic systems are used in two rules: Bayesian block and Knuth's rule. They executed two basic models for a simple RFID network including an ISO/IEC 14443-3-compliant reader and several tags. Both models appear to detect well the changes in command arrival rate [2].

Enhanced RFID tag detection accuracy application is used in distributed antenna arrays. In the arrayed system is the potential to scan the entire surrounding area, whereas the fixed antenna system can only be assigned to a fixed cell; there by leading to a potential reduction in the required number of antennas [3].

Efficient unknown tag detection in large-scale RFID systems are use for detected the unknown tag. They are fast and reliable probabilistic unknown tag detection scheme. The systems analysis protocols can significantly outperform other methods in terms of time efficiency, energy efficiency, and robustness [4].

Distance bounding scheme are the security solution for real-time location system. These systems are reliability of industrial applications is crucial and the need for adequate security measures is increasing. Verifying and identifying the physical proximity or location of a device is becoming an important security requirement in industrial applications relying RTLS and RFID technology [5].

Proposed Methods and Techniques	Contents	
	Advantages	***Disadvantages***
On missing tag detection In RFID systems	RFID tags can work within much greater distances; information can be read from a tag at up to 300 ft.	Tag collision can occur when numerous tags in the same area respond at the same time.
Piece-wise constant models for RFID traffic	As no line-of-sight is required, tag placement is less constrained.	The signal collision and ultimately to data loss.
Enhanced RFID tag detection accuracy	The antennas are physically connected to a center controller which is connected to the wireless carrier network's base station.	Deployment is the most expensive stage of a DAS.
Efficient unknown tag detection in large-scale RFID systems	Detection systems are highly customizable to accommodate specific client needs.	Detection software provides information based on the network address.
Distance Bounding	**Track assets without complex, expensive infrastructure.** .	A secure verification of a device's location relative to another device, so-called secure neighbor detection.

Table 1: Comparisons between different methods.

PROPOSED METHODOLOGY

This system proposed in missing tag detection with RFID traffic management; i.e. detect the missing tag in any multiple-path. In the mobile reader or RFID reader to detect any missing tags for each group and traffic management cause loss of time in execution of the operation. Radio frequency identification (RFID) authentication plays an important role in detection and verification of the users information so that the proposed method will implemented with evaluation and authentication of the RFID tag data with missing tag detection algorithm with encryption indexing process in which the pattern evaluation and detect the missing tag. So the proposed system will help us for the evaluation of RFID in large scale database as well. So that proposed methodology will make the system fast, secured and reliable.

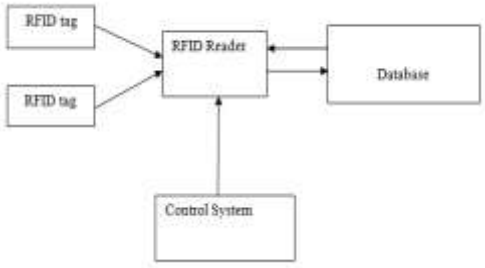


Figure 4: Block Diagram

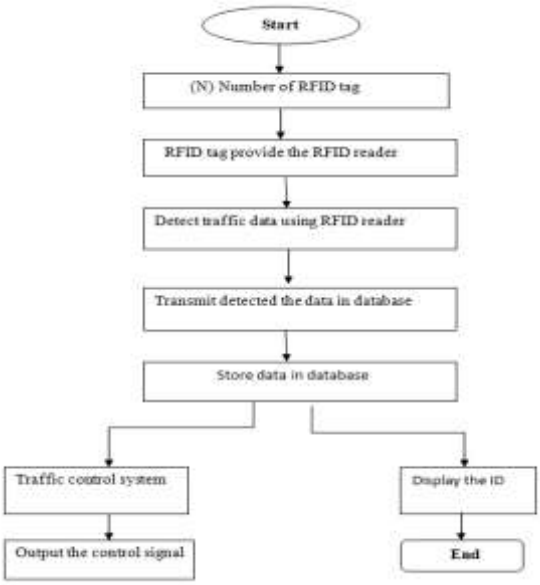


Figure 5: Flow Diagram of Proposed Framework

V. ACKNOWLEDGMENT AND POSSIBLE RESULT

Missing tag detection is to detect the RFID tag; in each loss of time for the execution for controlling the traffic. To implement fast matching pattern. To reduce in time consumption of RFID extraction method. To increase security level in execution.

CONCLUSION

This paper focuses on different five techniques and application. The proposed methodology is reliable, secured and fast which can be accommodate with big data system of RFID tags in which the system get evaluate largely. So that the proposed system will make the RFID implementation easy and fast.

FUTURE SCOPE

From observations of the proposed method the future work will include the missing tag detection with RFID traffic management. This information can be further used for tracking of criminals, e-tolling of vehicles, entire surrounding area, and so on.

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