

# Wireless Network Security Protocol with Cryptography and RFID System

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## Abstract

Wireless communication is very common and widely applicable technique in communication field. In these field new techniques invented that is called RFID technique, in which object having RFID tags on them are being accessed in radio frequency region. Cryptography (method involves the both process “encryption” and “decryption”) is widely used in network system’s security. It is also the ancient method of encoding the original messages for transmission. On the other side The RFID technology recently has gained enormous attention in various field like in database maintenances(in the library management system), media, industry and as well as in network security. In the Radio frequency identification (RFID) use of an object (typically referred to as RFID tag) applied to or incorporated into a product, animal, or person (user) for the purpose of identification and tracking using radio waves. Each member has its unique id or RFID tag. However security and privacy pose significant challenges on the system. This paper will describe about the brief introduction of the old and dynamic method employed for network security that is cryptography. Cryptographic technique is widely applicable in network security field but still we are suffering from hacking and unauthorized access. Hence we have introduced a new idea for being applicable in security field that is RFID technique. Here we will describe its various applications in various fields and how it can be implemented in network security. The security and privacy issues of RFID and their solutions will also be discussed. And the future possible ideas for the new technologies will also be discussed.

## Keywords

Encryption, decryption, RFID.

## I. Introduction

In present scenario the no. of subscriber with wireless access of internet through laptop, personal digital assistants (PDA’s), cellular phones, pagers and other wireless devices are increasing rapidly. In 1998, 1.2 million people had wireless web access. Hence wireless communication is one of the famous methods of interchanging information. Network is a group of system or entities which are connected by a communication medium either it may be wired or wireless and this whole environment are called networking.

- (1) Data confidentiality
- (2) Data integrity
- (3) Security
- (4) Data identification
- (5) Authorized access

In this paper we will discuss one ancient method for achieving secure communication that is known as cryptography in which this can be done with the help of two operations called encryption & decryption. It is very secure way of communication in a network but still we are suffering from hacking or unauthorized access hence here we will introduce another concept which may be applicable for network security due to its various enormous applications in secured communication. Here we will just discuss the justification

that RFID technique may be applicable in security purposes. RFID systems needs two components that are RFID transmitter (used to emit radio freq. signal) RFID tags (works as a receiver) There are mainly two techniques which we will describe here, those are as follows:

- Cryptography
- RFID techn

## II. Cryptography

Before dealing with cryptography we need to explain the concept of cryptology. The basic classification or stages of cryptology are given as:

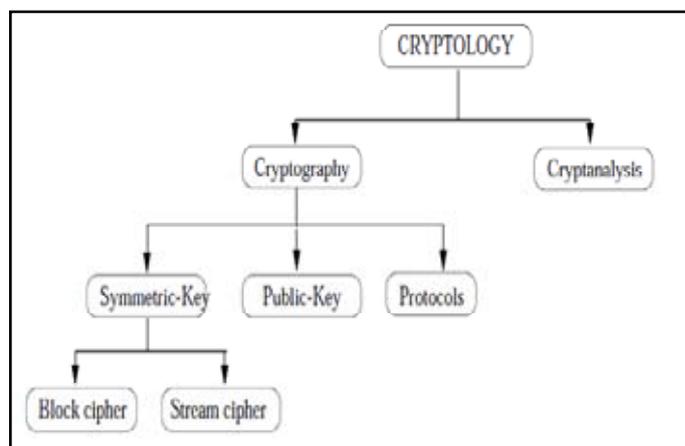


Fig. 1:

### A. Cryptology

It is made up from two GREEK words that are “KRYPTOS” which means hidden and “LOGOS” mean words hence we can say cryptology is an ancient art of hiding words for data security.

### B. Cryptography

It is the branch of cryptology in which we studied the design of techniques of ensuring authorization and secrecy of information. So data can be secured from unauthorized access.

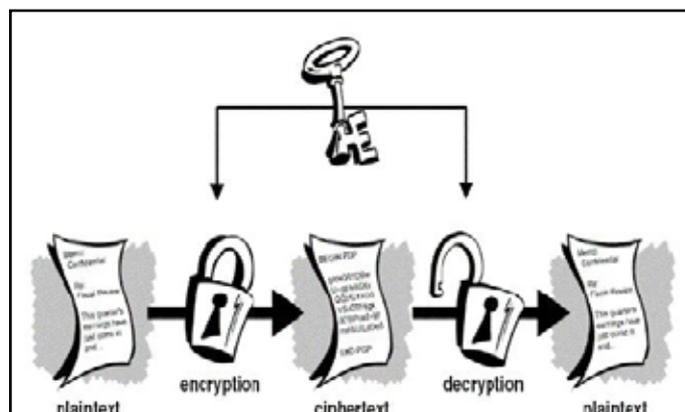


Fig. 2:

### III. RFID Technique

RFID is the acronym for Radio Frequency Identification. As the name describes itself that in this the objects are identified by the radio frequency signal. For this whole operation we need two components of this system those are

#### A. RFID transmitter

It is employed for the emission of radio frequency signal. It also works as a receiver which receives the signal which is reflected back from the object.

#### B. RFID Tag

It is employed for assigning a particular identity to a system so that it can get accessed by radio signal. It contains a chip which has some memory employed for storing information about the object. It also works as reflector which reflects the upcoming radio frequency signals back to the transmitter but with the encoded digital information. This can be retained by the transmitting antenna with the help of decoder employed with a digital to analog converter.

Radio Frequency Identification (RFID) is a type of automatic identification system. The purpose of an RFID system is to enable data to be transmitted by a portable device, called a tag, which is read by an RFID reader and processed according to the needs of a particular application. The data transmitted by the tag may provide identification or location information, or specifics about the product tagged, such as price, colour, date of purchase, etc. The use of RFID in tracking and access applications first appeared during the 1980s. RFID quickly gained attention because of its ability to track moving objects. As the technology is refined, more pervasive and invasive uses for RFID tags are in the works.

In a typical RFID system, individual objects are equipped with a small, inexpensive tag which contains a transponder with a digital memory chip that is given a unique electronic product code. The interrogator, an antenna packaged with a transceiver and decoder, emits a signal activating the RFID tag so it can read and write data to it. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit (silicon chip) and the data is passed to the host computer for processing. RFID tags come in a wide variety of shapes and sizes. Some tags are easy to spot, such as the hard plastic anti-theft tags attached to merchandise in stores. Animal tracking tags which are implanted beneath the skin of family pets or endangered species are no bigger than a small section of pencil lead. Even smaller tags have been developed to be embedded within the fibres of a national currency. While barcodes have historically been the primary means of tracking products, RFID systems are rapidly becoming the preferred technology for keeping tabs on people, pets, products, and even vehicles. One reason for this is because the read/write capability of an active RFID system enables the use of interactive applications. Also, the tags can be read from a distance and through a variety of substances such as snow, fog, ice, or paint, where barcodes have proved useless.

Currently, RFID tags are not widely used in consumer products because the price of the tags is still prohibitively expensive. However, as companies push for enhanced means of tracking products and profiling consumers, the increased demand and production of RFID technologies will drive down prices. Already, developments in RFID technology are yielding systems with larger memory capacities, wider reading ranges, and faster processing. In response, the market for RFID tags is growing explosively,

projected to reach \$10 billion annually within the decade.

It's important to have a clear idea of what data security means right from the start. Only then can you truly measure whether an RFID implementation is truly secure. Here are three qualities that define data security in an RFID context:

1. Controlled access to the data—only authorized entities (people, systems) can read and write information.
2. Control over access to the system—only authorized entities can configure and add to the system, and all devices on the system are authentic and trustworthy.
3. Confidence and trust in the system—Users share a general perception that the system is safe and secure. This is a more subjective criteria, but important.

### IV. Applications

#### A. Animal Tracking

RFID technology is very useful in the tracking of animals especially pets. The RFID tags are implanted on any of their body parts and by transmitting radio frequency signals these animals can be tracked and identified.



#### B. Maintaining Records of Individual

With the help of RFID records of each individual can be maintained and accessed when required and soon it is going to be implemented by the Indian Govt.

#### C. Networking

RFID can be used for the purpose of network security the famous electronics accessories mfg. company APPLE is going to implement this technique in network security

#### C. Banking Security

RFID and Biometric technology is being used in the locker system in banks and ATM's for providing better security.

### V. Conclusion

As cryptography is an ancient and dynamic method of achieving network security and is still being used widely but the idea behind this paper is to make use of RFID systems parallel with cryptography due to its enormous property of providing high degree of user and data authentication and better reliability. Hence a greater extent of security can be achieved by using RFID

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which is ready to be exhibited in a National Level Technical Workshop, which is going to be held atSSIPMT, Raipur.