Review of Red Tacton: Evolving Authorizations

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Abstract— With the advent of technology, everyone wants to be seamlessly connected and access the information at their fingertips. Thus, communication plays an imperative role nowadays. Existing communication technologies range from wired to wireless medium. Both wireless and wired communication have their own benefits and shortcomings.

With communication, protection also becomes an integral part. And this requirement has resulted into creation of many authorization tools such as card readers used in ATM, user pin codes etc. But since these tools were not secure enough, we moved onto biometric access control systems, wherein we used fingerprints or retina scans of the user. With all this been done, this paper would present you a different way of authorizing the user.

Thus, a new Human Area Networking (HAN) technology named as “Red Tacton” was introduced, which is positioned between wired and wireless communication. It instead of relying on electromagnetic waves or light waves to carry data, focuses on use of weak electric field on the surface of the human body as a transmission medium. This paper presents a review of Red Tacton and its practice in authorization.

Keywords— Communication, Authorization, Human Area Network (HAN), Red Tacton.

I. INTRODUCTION

Today we are living in an Information Age, where everyone wants to access the information at their fingertips. Thus, networking and communication are the two most important aspects of everyone’s life. Data communications refers to the transmission of data between two or more computers and a computer network refers to a collection of computers or devices that can exchange data.

Network can be categorized in different ways, like based on scale or scope of network, it is classified into Local Area Network (LAN), Metropolitan Area Network (MAN) and Wide Area Network (WAN). Based on type of service that a network caters, it is classified as Connection Oriented or Connection less networks.

Existing communication technologies range from wired to wireless medium. Wired communication happens using public switched telephone lines while Wireless communication refers to the methods of carrying data through the air or space using infrared, radio, or microwave signals. Wireless communication is better as compared to wired communication in terms of extra overheads required for establishing an end to end communication between the two end points entities, but they also have its own shortcomings. In wireless media, there is a sudden decrease in speed of transmission especially in multi-user environment leading to network congestion.

All the pre-existing technologies suffers from eavesdropping and signal interception. With communication, protection also becomes an integral part. As far as, for secure transmission of data, encoding and decoding can be done. But, this will not suffice our purpose when authentication and authorization is required.

And this requirement has resulted into creation of many authorization and authenticating tools such as card readers used in ATM, user pin codes etc. But since these tools were not secure enough, we moved onto biometric access control systems, wherein we used fingerprints or retina scans of the user. With all this been done, this paper would present you a different way of authorizing the user- “Red Tacton”.

This paper is organized as follows: Section I discusses Human Area Network (HAN), Section II discusses Red Tacton, Section III discusses Red Tacton as an Authorizing Tool in various applications. And, Section IV finally concludes our paper.

II. HUMAN AREA NETWORK (HAN) [1]

Human Area Network provides communication in devices via human body i.e. human body acts as transmission media. Using human body for communication may result in high throughput, better security and reduced setup cost of networks.

In ubiquitous services (which imply communication between electronic devices embedded in the environment in close proximity to people), if we could use the human body itself as a transmission medium, the this would be an ideal way of implementing Human Area Network because it would resolve all the problems comprising throughput reduction, low security and high network setup cost. [6]

This concept of intra-body communication, was first proposed by IBM [1]. However, all these technologies had two limitations:

1) The operating range through the body was limited to a few ten of centimetres.
2) The communication speed was only 40kbit/sec.

These limitations ascend from the use of an electric sensor for the receiver. An electric sensor requires two lines (a signal line and a ground line) whereas in intra-body communication,
there is essentially only one signal line i.e. the body itself, which leads to an unstable transmission line, so the signal is not transmitted appropriately.

Thus, Red Tacton was proposed which is free from these limitations of Human Area Network, which is discussed in the next section.

Fig 1: HAN Technology [1]

III. RED TACTON

Red Tacton is a new Human Area Networking technology introduced by Nippon telegraph and Telephone Corporation (NTT’s) that merged the terms: ‘touch’ and ‘action’ to coin the term ‘Tacton’, and then added the word ‘Red’ to emphasize warm and cordial communications, creating the name “Red Tacton”.

In the past, Bluetooth, infrared communication, radio frequency ID and other technologies have been projected to solve the “last meter” connectivity problem. However, each of these have various fundamental technical limitations that restrain their usage, such as fall-off in transmission speed in multi-user environment. Red Tacton is an implementation of ubiquitous network services among other two connectivity levels (WAN and LAN) for connectivity to personal information, media and communication devices in a sphere of ordinary daily activities— one meter problem.

It is positioned between wired and wireless technologies, allowing the connection without connectors, while at the same time permitting transmission of data only between two contact points. It thus has the feature of being tough to intercept.

Red Tacton is a HAN technology that uses the surface of the human body as a transmission path. The transmission path is formed at the moment a part of the human body comes in contact with a Red Tacton transceiver, and physical separation of these devices ends the communication.

A. Features of Red Tacton [2]

Red Tacton has three main features:

1) Touch: Communication takes place by a simple touch, which spontaneously initiates the flow of data between the two devices. For example, two people equipped with Red Tacton devices could exchange data by just shaking hands.

2) Broadband & Interactive: In disparity to the traditional wireless technologies, there is no interference even when several people use it in very close proximity. Because the body surface is the transmission path, increasing the number of connected users directly increases the available number of individual communication channels.

3) Any Media: The transmission media is not fixed. In addition to the human body, various conductors and dielectrics can be used as transmission media.

B. Working of Red Tacton [3][4]

Like every other transmission technology, Red Tacton also has a Transmitter and a Receiver. Transmitter should be with the user and the receiver can be with any device that needs data transfer.

Data is received using a photonic electric field sensor. The laser technology is used to convert the electric field into signals. Transmitter receives the signals from the interface, i.e. the Transmitter Circuit which is activated once it receives the signal.

Red Tacton relies on the principle that the optical properties of the electro-optic crystal varies according to the changes in the weak electric field. The Receiver senses changes in the weak electric field on the surface of the body caused by the transmitter.

Fig 3: Working of Red Tacton [3]
IV. RED TACTON AS AN AUTHORIZING TOOL

Red Tacton can be used for instinctive operation of computer-based systems in everyday life, provisional one-to-one private networks based on personal handshaking, device personalization, authentication, authorizing, and a host of other applications.

Today, preventing the leakage of confidential information has become a critical issue and thus there is an urgent need to enforce security in our applications. Also, as a result there is a need to incorporate authorizations so as to avoid abrupt changes to our data by unauthorized people.

Red Tacton can be used as an authorizing tool in various applications like unlocking a door with user verification to some important resources like army weapons, jewellery, providing access to bank lockers and automatic access to log data of a company etc.

A Red Tacton receiver in cabinet where important documents are stored enables lock administration and keeps a record of who accessed documents at what time. Thus only authorized persons can have the access. Carrying a mobile Red Tacton capable device in one’s pocket ID is verified and the door unlocked when the user holds the doorknob normally. Similarly secure lock administration is possible by combining personal verification tools such as fingerprint ID or biometric in the mobile terminal.

V. CONCLUSIONS

Red Tacton employs an exclusive electric field/photonics method, in Human Area Networking which give better performance in comparison with other existing short distance technologies. It surpasses the other methods in terms of communication distance, transmission speed and interactivity. Since it provides high speed communication, it can provide seamless service wherever, whenever and whoever uses it. It is highly secure due to the involvement of the two devices in end-to-end basis, thus impossible to get hacked.

Red Tacton has a wide range of unique new functional features and enormous potential as a Human Area Networking technology In future, where humans are destined to reach new heights of technology, a trend like Red Tacton will prove to be an advantageous invention with various diversified applications.

REFERENCES