

Advanced communication redaction essay sample



**ASSIGN
BUSTER**

RedTacton is a human area network technology that uses the surface of the human body as a safe high-speed network transmission path. We may have imagined the future as a place crawling with antennas and emitters, due to the huge growth of wireless communications and it gives an idea of using our body as a data transmission. Thus NTT labs, the Japanese telecom group had developed a revolutionary technology called “ Red Tacton”. The technology is called TACTON because this influences communication that starts by touching leading to various actions. “ Red Tacton” gives a whole new meaning to the term “ networking”. It is a new Human Area Networking technology which uses the surface of the human body, as a safe and high speed data transmission path. Red Tacton is a new technology that is completely different from wireless and Bluetooth or Infrared, as it does not rely on electromagnetic or a light wave to transmit data, also users can narrowly limit signal recipients rather than broadcasting to all devices within given range.

It makes use of weak electric fields on the surface of the body. Here, the human body acts as a transmission medium supporting IEEE 802. 3 half-duplex communication at 10Mbit/s. RED is used to convey the meaning of warmth in communication. Instead of relying on electromagnetic waves or light waves to carry data, a RedTacton transmitter couples with extremely weak electric fields on the surface of the body. The weak electric fields pass through the body to a RedTacton receiver, where the weak electric fields affect the optical properties of an electro-optic crystal. Physically separating ends the contact and thus closes the communication. The RedTacton chips

will be embedded in machines and contain a transmitter and receiver built to send and accept any form of data stored in digital format.

OVERVIEW OF REDTACTON:

- RedTacton is a new innovative Human Area Networking technology that turns the surface of the human body as a safe, high speed network transmission path.
- RedTacton takes a different technical approach. Instead of relying on electromagnetic waves or light waves to carry data, RedTacton uses weak electric fields on the surface of the body as a transmission medium. • Using RedTacton, communication starts when terminals carried by the user or embedded in devices are linked in various combinations according to the user's natural, physical movements.
- Communication is possible using any body surfaces, such as the hands, fingers, arms, feet, face, legs or toes. RedTacton works through shoes and clothing as well.
- Technically, it is completely distinct from wireless and infrared. A transmission path is formed at the moment a part of the human body comes in contact with a RedTacton transceiver, physically separating ends the contact and thus ends communication.
- A RedTacton transmitter couples with extremely weak electric fields on the surface of the body. The weak electric fields pass through the body to a RedTacton receiver, where the weak electric fields affect the optical properties of an electro-optic crystal. The extent to which the optical

properties are changed is detected by laser light which is then converted to an electrical signal by a detector circuit.

WHAT IS REDTACTON?

Human society is entering an era of omnipresent computing, when networks are seamlessly interconnected and information is always accessible at our fingertips. The practical implementation of omnipresent services requires three levels of connectivity:

- Wide Area Networks (WAN), typically via the Internet, to remotely connect all types of servers and terminals;

- Local Area Networks (LAN), typically via Ethernet or WiFi connectivity among all the information and communication appliances in offices and homes; and

- Human Area Networks (HAN) for connectivity to personal information, media and communication appliances within the much smaller sphere of ordinary daily activities- the last one meter.

NTT's RedTacton is a break-through technology that, for the first time, enables reliable high-speed HAN.

Human Area Networking (HAN) is a technology that safely turns the surface of the human body into a data transmission path at speeds up to 10 Mbps between any two points on the body.

HISTORY OF HAN:

In the past, Bluetooth, infrared communications (IrDA), radio frequency ID systems (RFID), and other technologies have been proposed to solve the “last meter” connectivity problem. However, they each have various fundamental technical limitations that constrain their usage, such as the precipitous fall-off in transmission speed in multi-user environments producing network congestion.

- The concept of intra-body communication was first proposed by IBM in 1996.
- This communication mechanism was later evaluated and reported by several research groups around the world.

All those reported technologies had two limitations:

1. The operating range through the body was limited to a few tens of centimeters.
2. The top communication speed was only 40 bit/s!!

These limitations were overcome by NTT (Nippon Telegraph and Telephone Corporation) located in Tokyo, Japan by using photonic electric field sensors and finally came up with a human area networking technology called ‘RedTacton’.

WORKING PRINCIPLE:

1. How Red Tacton works?

Using a new super-sensitive photonic electric field sensor, RedTacton can achieve duplex communication over the human body at a maximum speed of 10 Mbps.

1. The RedTacton transmitter induces a weak electric field on the surface of the body. 2. The RedTacton receiver senses changes in the weak electric field on the surface of the body caused by the transmitter. 3. RedTacton relies upon the principle that the optical properties of electro-optical crystal can vary according to changes of a weak electric field. 4. Redtacton detects changes in the optical properties of an electro-optic crystal using a laser and converts the result to an electric signal in an optical receiver circuit. It is to be noted that Redaction transceivers which integrate transmitter and receivers, are also available. The physical layer enables half-duplex communication (transmission and reception are done alternatively) using proprietary CSMA/CD protocol. As with Ethernet cards, each transceiver card has a unique address. The upper layer above this is compliant with TCP/IP protocol.

2. Method of communication with RedTacton

The transmitter sends data by inducing fluctuations in the minute electric field on the surface of the human body. The surface of the human body loses some field due to the returning to ground and electric field dissipated to the earth from legs. Data is received using a photonic electric field sensor that combines an electro-optic crystal and a laser light to detect fluctuations in the minute electric field. This sensor measures faint electric field by using a laser beam to detect fluctuations in the optical properties of electro-optic crystal that are caused by peripheral electric fields.

The illustration is as shown in the figure. It clearly depicts various paths of the field.

The crackling sensation one feels when shocked by static electricity is caused by an electric current of several dozen milli-amperes suddenly flowing into the body from the outside. The RedTacton electrode is covered with an insulating material, no current flows into the body from the RedTacton transceiver. As a result, there is no shock caused by the inflow of electric current from the outside. However, as in mobile phones, a weak induction current is created in the body owing to the minute electric field created near the body when the movement occurs. This induction current is very weak and similar to those occurring in everyday life. The size of the induction current emitted on the body with RedTacton is in conformity with the " Radio Frequency-Exposure Protection Standard established by the Association of Radio Industries and Businesses (ARIB). REDTACTON TRANSCEIVER:

Figure below shows the block diagram of a RED TACTON transceiver. The signal from the interface is sent to the data sense circuit and the transmitter circuit. The data sense circuit senses the signal and if the data is present it sends control signal to the transmitter which activates the transmitter circuit. The transmitter circuit varies the electric field on the surface of our body. This change in the electric field is detected by the electro-optic sensor. The output of the electro-optic sensor is given to the detector circuit, which in turn given to the interface of the receiving RED TACTON device.

Fig. Block diagram of Red TACTON transceiver

THREE FEATURES:

RedTacton has three main functional features. They are touch, broadband & interactivity, any media.

3. 1. TOUCH

Touching, gripping, sitting, walking, stepping and other human movements can be the triggers for unlocking or locking, starting or stopping equipment, or obtaining data. Using RedTacton, communication starts when terminals carried by the user or embedded in devices are linked in various combinations through physical contact according to the human natural movement.

3. 2. BROADBAND & INTERACTIVITY

Duplex, interactive communication is possible at a maximum speed of 10Mbps. Because the transmission path is on the surface of the body, transmission speed does not deteriorate in congested areas where many people are communicating at the same time.

3. 3. ANY MEDIA

In addition to the human body, various conductors and dielectrics can be used as transmission media. Conductors and dielectrics may also be used in combination. A communication environment can be created easily and at low-cost by using items nearby, such as desks, walls, and metal objects.

SYSTEM SAFETY:

4. 1. No current flowing into the human body from Red Tacton devices.

RedTacton uses the electric field that occurs naturally on the surface of the human body for communication. Transmitter and receiver electrodes are

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covered with insulating films. No current flows into the body from the RedTacton transceiver.

4. 2. Displacement current occurring in the body is small enough.

There is no current flowing from the RedTacton transceiver; however, the body indirectly receives a minute electric field. This causes electrons already present inside the body to move, creating a minute displacement current. This displacement current is similar to those occurring in everyday life.

4. 3. RedTacton conforms to the safety guideline of induced current.

RedTacton is in conformity to the “ Radiofrequency-exposure Protection RCR standard (RCR STD-38)” issued by the Association of Radio Industries and Businesses (ARIB).

COMPARISON WITH OTHER NETWORKS

The chart below shows the positioning of RedTacton with respect to existing communication technologies.

- * The focus on ubiquitous service has brought about the shortening of distances in communication.
- * RedTacton is positioned as the last 1m solution to ultimate close-range communication.
- * Wireless communication creates connections when signals arrive, allowing for easy connections because connectors are unnecessary.
- * However, seen from another aspect, the arriving signals can be intercepted, so security becomes an issue.
- * Wired communication transmits data between two connection points, so

interception is difficult and security can be considered to be high. However, connectors and cables are a nuisance.

Taking the above points in account, RedTacton is situated directly between wireless and wired communication. In other words, RedTacton allows for easy connection without connectors, while at the same time allowing transmission of data only between two contact points. It thus has the feature of being difficult to intercept.

Figure shows the comparison of RED TACTON device with other networks with respect to distance

COMPARISON WITH OTHER NETWORK TECHNOLOGIES

Evaluation criteria	Wireless LAN	Infrared	Red Tacton
Transfer Speed (Can DVD-quality images be sent?)	E	P	E
Performance deterioration during periods of Congestion (Simultaneous use by many people in small spaces)	P	E	E
Duplex data transfer (Interactive processing)	E	E	E

Performance:

E: Excellent,

P: Poor

APPLICATIONS:

The applications are quite intuitive.

→ Carrying a mobile RedTacton 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 finger print ID or biometric in the mobile terminal.

→A RedTacton 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.

→In human body, it is used to detect ailments such as abnormal growths, tumors, and excrescences affected tissues and thus helps in allowing providing a cure.

→RedTacton allows communication in outer space and in water where the speech constraints are very high and thus enables a highly efficient means of expression of speech which is beyond the purvey of human beings.

→By shaking hands, the ID and all information of people can be exchanged without the necessity of speech and so vital information can be exchanged.

Advantages

- Data transfer is faster and easier through this technology.
- Data loss during transfer is less.
- Use of minimum amount of power (of some mili volt range).
- Security is more.

Disadvantages

- It can be useful within few centimeters.
- Effects on human body is still under research.

CONCLUSION:

Human society is entering an era of ubiquitous computing, where everything is networked. By making human area network feasible, RedTacton enable ubiquitous services band therefore more intimate and easier for people to use, when networks are seamlessly interconnected and information is always accessible at our fingertips. . The existing networks namely Wide Area Networks (WAN), typically via the Internet, to remotely connect all types of severs and terminals, Local Area Networks (LAN), typically via Ethernet or Wi-Fi connectivity among all the information and communication appliances in offices and homes; and Human Area Networks (HAN) for connectivity to personal information, media and communication appliances within the much smaller sphere of ordinary daily activities. However compared to the technologies RedTacton is definitely having an upper edge given its versatility and omni-features.

In the days to come where man is destined to scale new heights of technology , a technology like RedTacton is likely to propel him in the right direction giving him hope and motivation than any other technology man is able to perceives on the human centered interaction.