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Short Communication

Measure of Wireless PAN based on the standard IEEE 802.15 of optical wireless communication technologies for the development of bluetooth as important consideration

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Abstract

Development of WCTP was initiated by the Messaging Standards Committee and submitted to the Radio Paging Community. When the first proposal was received, a sub-committee was established to improve the protocol and issue it as a specification. The sub-committee was moved into the PTC (Paging Technical Committee) which is a volunteer committee composed of industry representatives. The PCIA (Personal Communications Industry) accepted the first full release and adopted the protocol as a PCIA standard. The current version is WCTP 1.3.

Keywords: WCTP 1.3, Radio Paging.

1. Introduction

Optical wireless communication (OWC) refers to transmission in unguided propagation media through the use of optical carriers, i.e., visible, infrared (IR), and ultraviolet (UV) band. Signaling through beacon fires, smoke, ship flags and semaphore telegraph can be considered the historical forms of OWC. Sunlight has been also used for long distance signaling since very early times. The earliest use of sunlight for communication purposes is attributed to ancient Greeks and Romans who used their polished shields to send signals by reflecting sunlight during battles. In 1810, Carl Friedrich Gauss invented the heliograph which involves a pair of mirrors to direct a controlled beam of sunlight to a distant station. Although the original heliograph was designed for geodetic survey, it was used extensively for military purposes during the late 19th and early 20th century. In 1880, Alexander Graham Bell invented the photo phone, known as the world's first wireless telephone system. In March 1989 Tim Berners-Lee issued a proposal to the management at CERN for a system called "Mesh" that referenced ENQUIRE, a database and software project he had built in 1980, which used the term "web" and described a more elaborate information management system based on links embedded in readable text: "Imagine, then, the references in this document all being associated with the network address of the thing to which they referred, so that while reading this document you could skip to them with a click of the mouse." Such a system, he explained, could be referred to using one of the existing meanings of the word hypertext; a term that he says was coined in the 1950s. There is no reason, the proposal continues, why such hypertext links could not encompass multimedia documents including graphics, speech and video; so that Berners-Lee goes on to propose the term hypermedia

2. Wireless Personal Area Network

A wireless personal area network (WPAN) is a personal area network- a network for interconnecting devices centered on an individual person's workspace- in which the connections are wireless. Wireless PAN is based on the standard IEEE 802.15. The two kinds of wireless technologies used for WPAN are Bluetooth and Infrared. A WPAN could serve to interconnect all the ordinary computing and communicating devices that many people have on their desk or carry with them today; or it could serve a more specialized purpose such as allowing the surgeon and other team members to communicate during an operation.

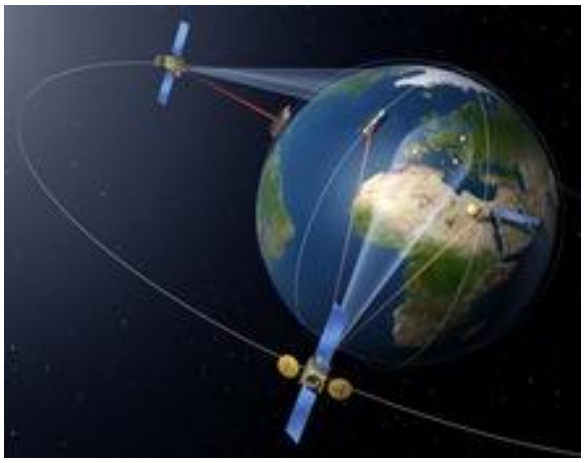

Figure 1: European Data Relay Satellite (EDRS) system

3. Problems with the use of this technology could include

3.1 Security

Considerable effort would be required to make WBAN transmission secure and accurate. It would have to be made sure that the patient ‘’secure‘’ data is only derived from each patient's dedicated WBAN system and is not mixed up with other patient's data. Further, the data generated from WBAN should have secure and limited access. Although security is a high priority in most networks, little study has been done in this area for WBANs. As WBANs are resource-constrained in terms of power, memory, communication rate and computational capability, security solutions proposed for other networks may not be applicable to WBANs. Confidentiality, authentication, integrity, and freshness of data together with availability and secure management are the security requirements in WBAN. The IEEE 802.15.16 standard, which is latest standard for WBAN, tried to provide security in WBAN. However, it has several security problems.

3.2 Interoperability

WBAN systems would have to ensure seamless data transfer across standards such as Bluetooth, ZigBee etc. to promote information exchange, plug and play device interaction. Further, the systems would have to be scalable, ensure efficient migration across networks and offer uninterrupted connectivity.

3.3 System devices

The sensors used in WBAN would have to be low on complexity, small in form factor, light in weight, power efficient, easy to use and reconfigurable. Further, the storage devices need to facilitate remote storage and viewing of patient data as well as access to external processing and analysis tools via the Internet.

A key concept in WPAN technology is known as "plugging in". In the ideal scenario, when any two WPAN-equipped devices come into close proximity (within several meters of each other) or within a few kilometers of a central server, they can communicate as if connected by a cable. Another important feature is the ability of each device to lock out other devices selectively, preventing needless interference or unauthorized access to information. The technology for WPANs is in its infancy and is undergoing rapid development. Proposed operating frequencies are around 2.4 GHz in digital modes. The objective is to facilitate seamless operation among home or business devices and systems. Every device in a WPAN will be able to plug into any other device in the same WPAN, provided they are within physical range of one another. In addition, WPANs worldwide will be interconnected. Thus, for example, an archeologist on site in Greece might use a PDA to directly access databases at the University of Minnesota in Minneapolis, and to transmit findings to that database.

4. Personal digital assistant

It is also known as a handheld PC, or personal data assistant, is a device that functions as a personal information manager. The term evolved from Personal Desktop Assistant, a software term for an application that prompts or prods the user of a computer with suggestions or provides quick reference to contacts and other lists. PDAs were largely discontinued in the early 2010s after the widespread adoption of highly capable, in particular iOS and Android- sed, smart phones.

Nearly all PDAs have the ability to connect to the Internet. A PDA has an electronic visual display, enabling it to include a web browser; all models also have audio capabilities enabling use as a portable media player, and also enabling most of them to be used as mobile phones. Most PDAs can access the Internet, intranets or extranets via Wi-Fi or Wireless Wide Area Networks. Most PDAs employ touch screen technology.

Military interest on photophone however continued. For example, in 1935, the German Army developed a photo phone where a tungsten filament lamp with an IR transmitting filter was used as a light source. Also, American and German military laboratories continued the development of high pressure arc lamps for optical communication until the 1950s. In modern sense, OWC uses either lasers or light emitting diodes (LEDs) as transmitters. In 1962, MIT Lincoln Labs built an experimental OWC link using a light emitting GaAs diode and was able to transmit TV signals over a distance of 30 miles. After

the invention of laser, OWC was envisioned to be the main deployment area for lasers and many trials were conducted using different types of lasers and modulation schemes

5. Conclusion

A number of intelligent physiological sensors can be integrated into a wearable wireless body area network, which can be used for computer-assisted rehabilitation or early detection of medical conditions. This area relies on the feasibility of implanting very small biosensors inside the human body that are comfortable and that don't impair normal activities.

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