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The Concept of Wireless Bluetooth Technology

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Abstract

The Bluetooth technology or the Personal Area Network (PAN) technology is widely using wireless technology having lots of advantages like low cost, low power used; provide communication of voice as well as data anywhere within the range. Bluetooth is the short-range radio technology. This technology is the replacement of cables normally used to connect one device to another device. We can connect various devices like wireless mouse, wireless keyboard, and wireless headphones to the laptop or computer through the Bluetooth rather than cables. This paper describes the information of some uses, advantages, architecture and applications of wireless Bluetooth technology.

Keywords*: - Radio technology, Wireless Transmission, Piconet, Scatter net, PAN technology.* `

INTRODUCTION

Bluetooth is the name of new technology which uses short range radio links to transmit the data as well as voice. This technology is developed by Dr. Jaap Haartsen in 1990. Bluetooth, a low energy, Devoice- to- devoice wireless technology was developed in an Ericsson lab in Lund, Sweden in the 1990's and became a global standard of short-range wireless transmission. When the Bluetooth technology celebrated its 10th anniversary in 2008, the number of Bluetooth-based devices shipped in ten years was already 2 billion. Now, this technology is uses in various mobile phones and computers and almost all electronics devices, medical and health devices, sports and fitness devices, cars and smart homes. Bluetooth

Technology becomes standard for device-to-device communications.

Bluetooth technology is also called as Personal Area Network (PAN) technology. This technology implemented using the IEEE 802.15 standard. The key features of Bluetooth are robustness, low complexity, low cost. The power consumption of Bluetooth is very low and it offers the range of ten meters. Because of these features Bluetooth used in many applications. Bluetooth radio models operate in the unlicensed ISM band at2.4 GHz, and avoid interface from other signals by hopping to a new frequency after transmitting or receiving a packet.2.4 GHz ISM bands is used by the Bluetooth. This band is divided into79 channels and each channel is of bandwidth 1MHz. Compared with other system in the same frequency band, the Bluetooth radio hops faster and uses shorter wavelength. The advantages of Bluetooth it will allow the replacement of the many propriety cables that connect one device to another with one universal radio link. Thus, the Bluetooth is a wireless LAN technology designed to connect devices of different functions such as telephones, computers, printers etc.

A Bluetooth LAN is AD hoc network. It is possible to connect the Bluetooth LAN to the Internet. The Bluetooth LAN is small in nature. The specified rate of data transmission is 1Mbps. Bluetooth uses an advanced version of FSK, called GFSK(FSK with Gaussian bandwidth filtering) type of modulation. Maximum range of Bluetooth is 10 meters. Bluetooth communication does not support routing. There are some applications of Bluetooth like SMS, EMS, MMS. SMS service provide transmission of messages up to 160 characters. Sending and receiving of SMS via Bluetooth is possible during data or voice transmission.

Through the Bluetooth transmission of EMS and MMS are possible. Enhanced Message Service (EMS) is next step of SMS. Through the EMS we can send message up to 760 characters and Multimedia Message Service (MMS) is used to transmit large images, short video clips etc

PROBLEM FORMULATION

We proposed this paper based on concept of Wireless Bluetooth technology. Bluetooth technology provide wireless transmission within a short range. Now a days this technology is widely used

various devises for communication purpose.

METHODOLOGY

In Bluetooth two different types of networks are defined. They are as follows:

- Piconet.
- Scatter net.

Piconet: The first type of Bluetooth network is called as piconet or small net. The following is the architecture of piconet.(See Figure:-1)

This network contains eight nodes. One of them is called as master node or primary node. Remaining seven nodes are called as slaves or secondary nodes. All slaves are synchronised in all aspect with the master. A piconet can have only one primary node or master node. In piconet the communication between master to slave is one-to-one or one-to-many. In piconet communication can takes place between master and slaves but no direct slave to slave communication is take place in piconet.

Scatter net: Scatter net is the second type of Bluetooth network. Many piconets are simultaneously in a given area and they may even overlap each other this network is called as Scatter net. The architecture of Scatter net is as follows: -

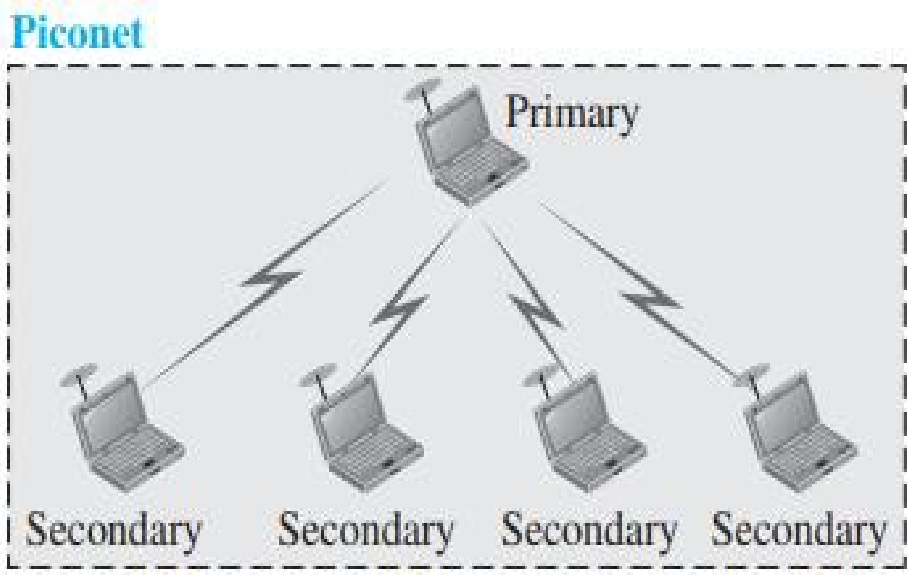

Figure:-1 Piconet

The two or more piconets are combined to make one scatter net. The above figure shows the combination of two piconets. In scatter net the slave in first piconet is act as master of the another piconet. It will receive the message of first piconet by acting as a slave and then delivers the message to the slave in the second piconet as shown in the figure. So the same device can act master in first piconet and slave in the second piconet. With increase the number of piconets, the possibility of collision is increases. This will result degradation of performance. Therefore, a device can participate in two or more piconets by means of the time-sharing process.

A Bluetooth device can act as a master in only one piconet but it can work as a slave in multiple piconets. One of the important issues in the scatter net is that the utilization of bandwidth is not optimal. This is happening because in scatter net one device can changes its role and takes part in different piconets. Another important issue in the piconet is the timing that a device would be missing when it participates in more than one piconets. If master of the piconet temporarily become a slave in some other piconet then it will be missing from its own piconet for that much time. This reduce the quality of Bluetooth links.

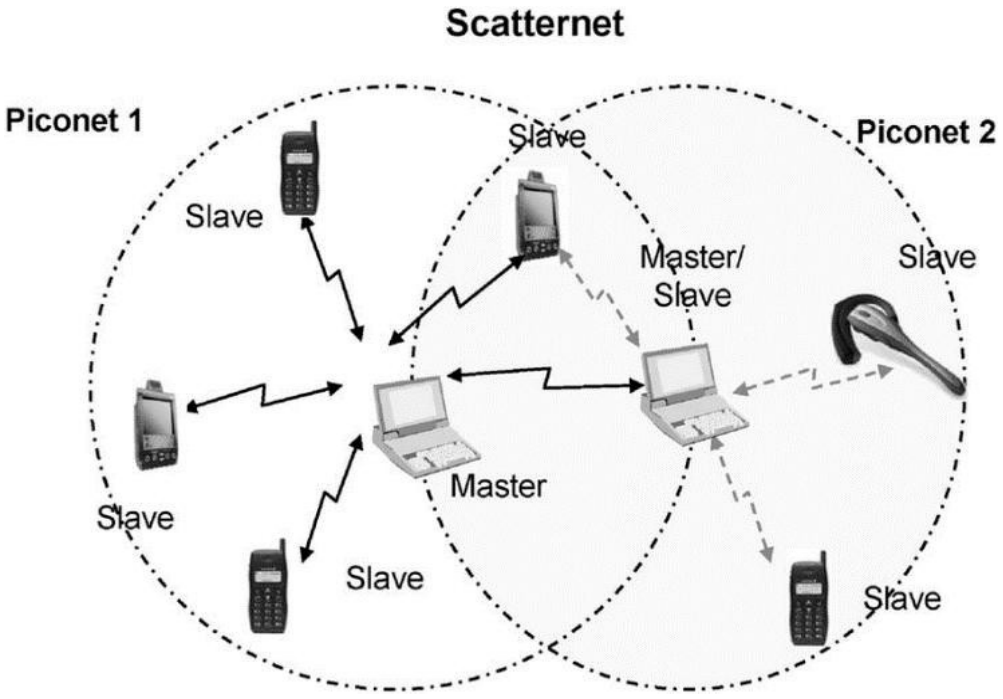

Figure:-2

FUTURE WORK

Bluetooth technology has good future because it fulfils need of short-range communication very neatly. The current version of the Bluetooth is improved its security as well as capability. In future the new versions of the Bluetooth are developed with the high security and large range.

CONCLUSION

In this paper I descried the brief introduction of Bluetooth technology with its architecture, feature and applications. Bluetooth is a new global standard for data as well as voice transmission. Bluetooth technology is the replacements of the cables for the transmission. It having lots of advantages like low cost, low power consumption, low cost of network devices. It is widely using wireless technology for short range communication. Now a days Bluetooth technology is used everywhere in various companies, in various devices, health care centres, for the wireless transmission. Bluetooth is very simple use technology, The Bluetooth enabled devices no need to install drivers.

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