INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & MANAGEMENT

STUDY PAPER ON WIRELESS COMMUNICATION AND ZIGBEE TECHNOLOGY

Laxmi Vijayvargiya[1], Ashwini Shukla[2], Naveen Mukati[3]
B.E. (EC) Student[1, 2]
Department Of Electronics and Communication[1, 2, 3]
Lakshmi Narain College Of Technology, Indore (M.P)[1, 2, 3]

ABSTRACT

India's telecommunication network is the second largest in the world by number of telephone users (both fixed and mobile phone). It is Telecommunication has supported the socioeconomic development of India and has played a significant role to narrow down the rural-urban digital divide to some extent. It also has helped to increase the transparency of governance with the introduction of e-governance in India. The Zigbee is a wireless standard based on IEEE 802.15.4 standard. Design for sensor and controlling the local network. It is used for application that requires low power consumption, low data rates, security, Bluetooth. Zigbee operates in the frequency range of 2.4GHz.and its data rates 250kbps.Zigbee is one of the most widely used transceiver standard in wireless sensor network. In this paper we study on Zigbee technology (IEEE 802.15.4) with application.

KEYWORDS: Wireless Communication, Zigbee, IEEE 802.15.4 Standard LR WPAN.

INTRODUCTION

Major sectors of the Indian telecommunication industry are telephone, internet and television broadcast Industry in the country which is in an ongoing process of transforming into next generation network, employs an extensive system of modern network elements such as digital telephone exchanges, mobile switching centers, media gateways and signaling gateways at the core, interconnected by a wide variety of transmission systems using fiber-optics or Microwave radio relay networks.

Wireless Technology is being developed rapidly nowadays. Advancement in micro electromechanical systems brings integration of sensing, signal processing and RF capability on very small device. All kind of portable application tends to be able to communicate without the use of any wires. Aim of wireless communication is to gather information or perform certain task in the environment. A typical sensor node contains three are collection, computation and communication units, Based on the request of sink, gathered information will be transmitted wirelessly. The collection unit has series of sensors. Computation unit contains transceiver to transmit and receive data. The reasons for using Zigbee are:

- Reliable and self healing.
- Supports large no. of nodes.
- Easy to deploy.
- Very long battery life.
- Low cost.
- Can be use globally.
- No new wires.

Zigbee is one of the most widely utilized Wireless sensor Network standards with low power, low data rate, low cost and short time delay characteristics. The word Zigbee comes from Zigzagging patterns of honey bees between flowers, represents the communication between nodes in a mesh network.

Fig.1: ZigBee Target Markets

Table 1: Features Comparison of IEEE 802.11b, Bluetooth and ZigBee

Feature(s)	IEEE 802.11b	Bluetooth	ZigBee
Power Profile	Hours	Days	Years
Complexity	Very Complex	Complex	Simple
Nodes/Master	32	7	64000
Latency	Enumeration up to 3 Seconds	Enumeration up to 10 seconds	Enumeration 30ms
Range	100 m	10m	10m-300m
Extendibility	Roaming Possible	No	YES
Data Rate	11Mb/s	1Mb/s	250kb/s
Stack size	100+ kbyte	100+ kbyte	8-60 kbyte
Topology	Star	Star	Star, cluster, mesh
Security	Authentication Service Set ID (SSID), WEP	64 bit, 128 bit	128 bit AES and Application Layer user defined

OPTICAL FIBER CABLE

Fiber-optic communication is a method of transmitting information from one place to another by sending pulses of light through an optical fiber. The light forms an electromagnetic carrier wave that is modulated to carry information. Fiber is preferred over electrical cabling when high bandwidth, long distance, or immunity to electromagnetic interference are required.

Optical fiber is used by many telecommunications companies to transmit telephone signals, Internet communication, and cable television signals. Researchers at Bell Labs have reached internet speeds of over 100 petabyte*kilometer per second using fiber-optic communication.

ZIGBEE PROTOCOL

Zigbee protocol architecture consists of a stack of various layers where IEEE 802.15.4 is defined by physical and MAC layers while this protocol is completed by accumulating Zigbee's own network and application layers.
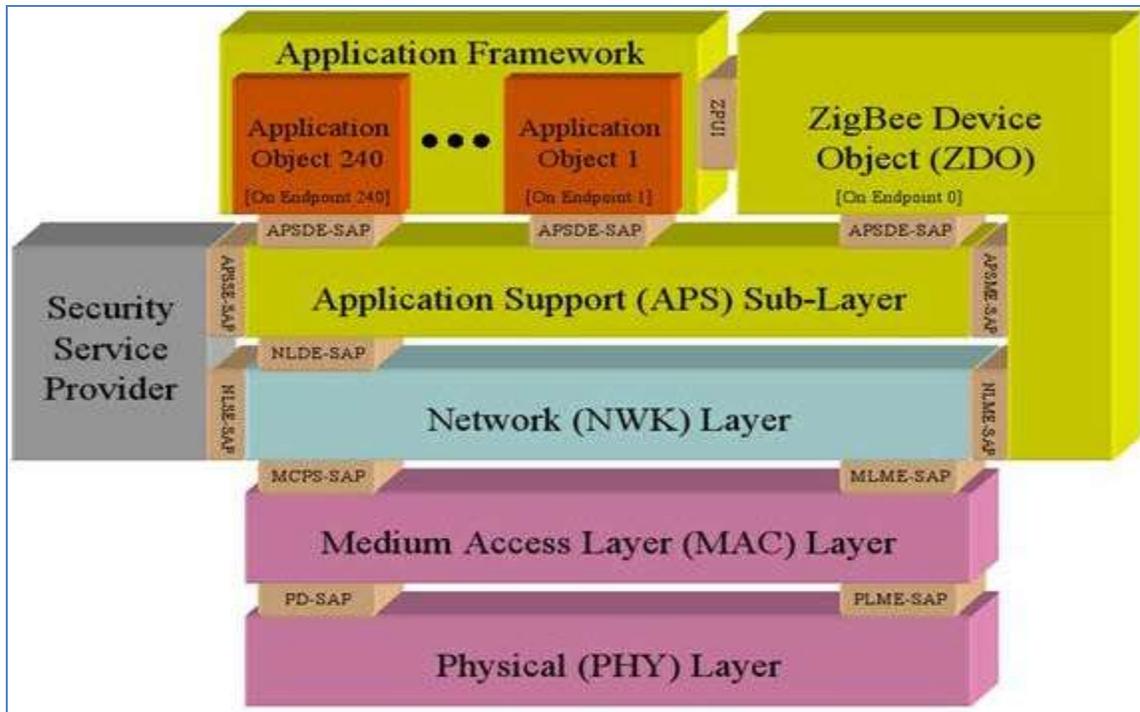
Fig. 2: Zigbee protocol architecture [1]

CONCLUSION

Since there are no global standards so far in wireless sensor networks, the Zigbee plays vital role in most of the wireless application. In most industries it is observed, there is an increasing demand of Zigbee based wireless applications. This paper presents description of Zigbee wireless standard.

REFERENCES

[1] https://www.elprocus.com/what-is-zigbee-technology-architecture-and-its-applications.
[2] .WWW.zigbee.org.
[3] "Hand on Zigbee-2007 security essentials ender yuskel hanne riis nielso fleeming nielsoninformatics and mathematical modelling, technical university of Denmark Richard petersens plads bldg. 321,dk-2800 kongens lyngby,Denmark
[4] Shahim farahmi "Zigbee wireless network and transceives".
[5] Khanh tuan le designing a Zigbee-ready ieee 802.15.4 compliant radio transceiver chipcon,11/2004.