Zigbee: Introduction, need, working, architecture, and applications

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Abstract: *For setting up a personal area network with less expense, a technology is needed. This can be possible with the help of Zigbee. Zigbee is suite of protocols that are used for communication. Zigbee is used due to its features including less consumption of power and rate of data. Zigbee is used in those area where projects are on small level or for the mini projects that need less resources for making the communication. In this way, we can utilize the available resources for other projects by using less resources for mini projects. Moreover, power consumption can be reduced by using the Zigbee technology. This Research paper focuses on all the various important aspects of the Zigbee including the introduction, Applications and architecture and so on.*

Key Words: *Protocols , Resources , Zigbee , Communication, Concept*

1. INTRODUCTION:

Zigbee is a technology that uses the standards of networks for communicating with other networks. [1] This technology used for setting up personal area network for mini projects with low cost and low power consumption and less resources by reducing the cost to setup the network.[2] This is type of technology is used for remote based applications for controlling the applications and for the applications that use the sensors.[3] This is type of technology is used for remote based applications for controlling the applications and for the applications that use the sensors. This is type of technology is used for remote based applications for controlling the applications and for the applications that use the sensors. [4] Zigbee also allows the sleeping mode for reducing the power consumption that is consumed by the devices. In this way, the resources can be utilized efficiently. This technology is also used in various industries for making the management better in terms of assets like machines to be used in the factories and so on. [5] The need for zigbee technology is increasing day by day due to the setup of many mini projects every year. These mini projects are more as compared to the number of large projects exist. All the mini projects uses less power consumption and resources. That's why the need of zigbee increased.

2. NEED:

Sometimes project size is big and need of resources is high like power, computing power and so on. But, if size or scale of the project is small, then the utilization of resources is needed. Because mini project needs are limited. Then a technology is needed that can handle the projects where the requirement of the resources is very less. Such type of needs can be completed by using the Zigbee technology. Data rates in this technology is lower than as compared to the other technologies like Bluetooth and Wireless networks. Zigbee is used for monitoring purposes like monitoring the condition of the patient who wear the device of Zigbee. In such kind of patients, various symptoms like blood pressure ,heart beat and so on, can be monitored by using the Zigbee device.

3. WORKING:

Zigbee is a specification that is based on the standard IEEE 802.15.4.The physical range of Zigbee can be from 10 to 20 meters approximately. Zigbee was develop by ZigBee Alliance. Device that uses ZigBee protocol is known as ZigBee device object. ZigBee architecture includes various layers and sub layers. Architecture of Zigbee based on layering architecture. Layers that exist in the architecture of the Zigbee are Application layer, Network layer, Medium Access Control layer and physical layer. Explanations of these layers including the architecture of the ZigBee is given below-:

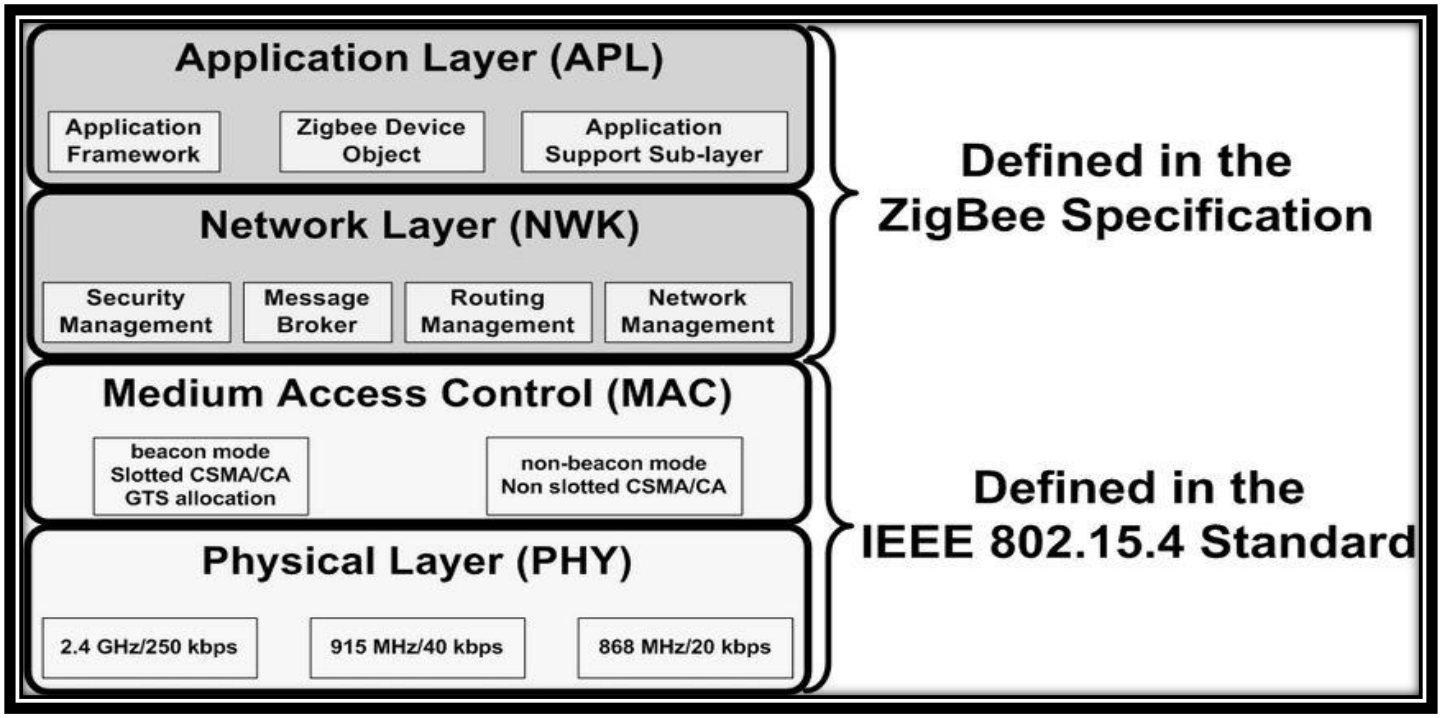

Fig. 1: ARHCHITECTURE OF ZIGBEE PROTOCOL

- **Physical Layer:** The process of modulation and demodulation is performed by the physical layer. This layer perform the demodulation on the incoming signals. On the other hand side, Modulation is performed on the outgoing signals.

- **Media Access Control Layer:** This layer helps to avoid the collision. This layer senses the carrier and transmit the frames. For making the transmission reliable it uses the synchronization of the frames.

- **Network Layer:** This layer exist in the middle of Application and Mac layer. This layer helps to manage the admission of new device in network, to discover route from source and destination ,initiate a network connection and so on.

- **Application Layer:** This layer helps for interfacing with layer of network for various services including data service. This layer also provide the required services for applications.

4. APPLICATIONS: There are applications of the big data. Some of them are given below-:

- Zibee technology is used in many home based or home automation projects. Thus, this technology is helpful in home automation.
- This technology is also used in various security based systems for monitoring purposes or monitoring the level of security.
- For reading the meter of various devices ,Zigbee can be used. This includes the meters used in various Transportation systems, devices and other equipments.
- This technology is also used in various remote control systems for controlling the devices without the need of any wire via wireless medium.
  Zigbee is also used in various health related devices and equipments for monitoring the various things like no of steps, heartbeat during running and so on.

5. ACKNOWLEDMENT:

While making this research paper, I have put all of my best and possible efforts for making this research paper. I hope this research paper will be useful and helpful for the authors who want to do further research Related to Zigbee and related techniques.

6. CONCLUSION:

The use of wireless technology is increased after the introduction of the wireless technology and wireless sensor networks. Zigbee is also a part of these technologies. Zigbee is a new hope for small scale projects where the

need of power consumption and computing power is very low. In future, the scope of the zibgee technology will be increase more and more with the introduction of small scale projects.

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