

A Proposed Model of Crypto in ZigBee Network

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Abstract—Researchers and scientists are trying to improve in functioning of wireless sensor technology time to time; but as time passes the load of data transmission with integrity and security become a challenge. So many algorithms and technologies were implemented on wireless sensor network to take best outcomes at destination point. As like the Bluetooth used for wireless transmission of data and after that a ZigBee protocol with database used by researcher Aamir Saikh and Siraj Pathan [1]. This provides many advantages like low cost, low power consumption and low data rate. They use a composition of ZigBee RF chip, sensor and MCU for general life applications and industries. As we have studied this research work then an idea hits in mind that the result of performance is good then why not we use this new method for our military purposes as low power consumption. Because in the hilly areas to provide continues power is a big challenge in itself. So in this paper we proposed a new security algorithm like neural network with existing composition of ZigBee protocol to make secure transmission over wireless network.

Keywords—WSN, ZigBee protocol, Data packet, Neural network.

I. INTRODUCTION

As the population of world increasing very rapidly then the user of network also increases with the same speed. So it is a necessity for users to use wireless network in comparison to wired network. WSN has best features of data collection, transmission, and processing. There are many advantages as compared to wired network, for example, convenient organizing network, less influence to environment, low power dissipation, low price, etc.

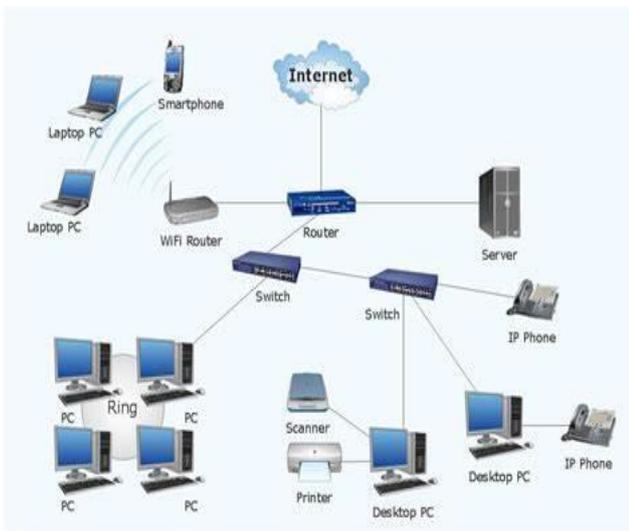


Figure 1: Basic Diagram of Wireless Network

Now, near field wireless communication technology has been followed mostly, mainly Bluetooth, wireless local area network (WLAN), infrared, etc. But, they have a number of limitations, for example, complexity, high power dissipation, less distance, networking in small level. In way to satisfy the necessity of low power dissipation and low speed among wireless communication items, a new type of wireless net technology Zigbee emerges with security algorithm as the times require. In this paper, we will represent the networking technology and advantage of ZigBee network along with neural networks. The method of combination of Zigbee & RFID with crypto algorithm that can be used in many areas. The basic diagram of wireless network is as following.

II. STRUCTURE OF NETWORK

There are multilevel network structures in a Zigbee network which supports mainly include star, tree, and mesh network, shown in Figure 2. They are called complete when a Coordinator, the router, and the end device connected with each other. The Coordinator and the router need full function (FFD), but the end device could select either full function device (FFD) or reduced function device (RFD). The main function of RFD is to access data information and transmit the information to its parent node; this is not work like to transmit data over network, route discovery, and route management [2].

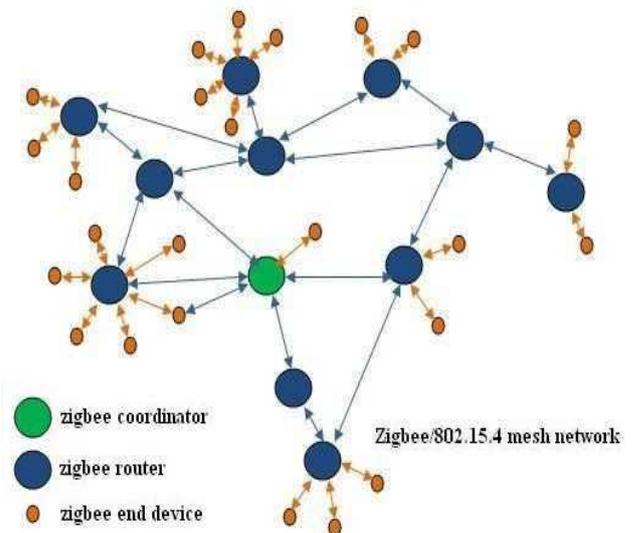


Figure 2: ZigBee Structure

The responsibility of RFD is to perform building a new network, transmitting network beacon, managing nodes in

the network, and storing network information, etc. Star network is composed of a Coordinator and an end device or multiple end devices, the end device could only communicate with Coordinator, it cannot communicate with end device, so star network is called single-hop network [3]. The tree network and mesh network have routing function, so they are called multi-hop network.

III. NEURAL NETWORK

Neural network is information processing system that works on biological nervous system. In this system, large numbers of processing elements are connected together work to resolve a specific problem [4].

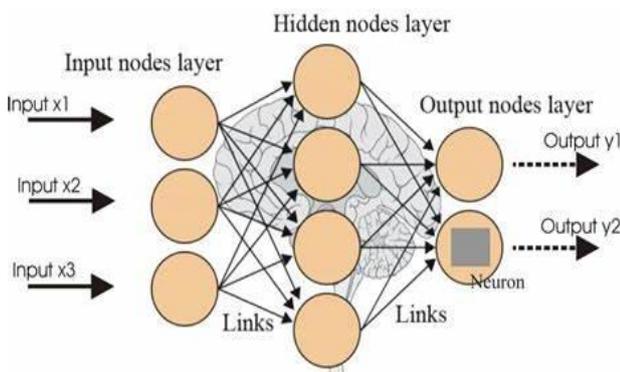


Figure 4: Basic Structure of Neural Networks

Neural networks build a model that states complex relationship between inputs and outputs. Features of neural network are:

- They are extremely powerful computational devices.
- Massive parallelism makes them very efficient
- They can learn and generalize from training data – so that there is no need for enormous feats of programming.
- Neural networks are fault tolerant it means graceful degradation in biological systems.
- They are very noise tolerant so they can cope with situations where normal symbolic systems would have difficulty.
- In principle, neural network can do anything a symbolic/logic system can do and more.
- Each neuron in neural network does some amount of information processing.
- It derives input from some other neuron and in return gives its output to other neuron for further processing.

IV. PROPOSED MODEL

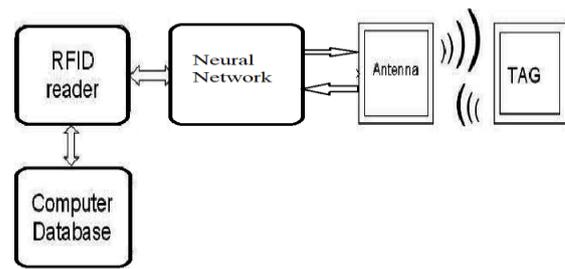


Figure 4: Proposed model of Network

V. ADVANTAGES

There is very wide area for the use of Zigbee wireless communication technology with merits. This network has controlled the hold in the area of industries and corporation since last many years. Especially home automation and industry control will be the main application fields. This communication was performed by human general life but as we combined a proposed algorithm then it becomes to implement in vast field of defense zone [5] with more security. In this paper some efforts has done to achieve the secure transmission over the network with low cost and low data rate.

VI. LIMITATIONS

As it is already discussed that the proposed technology implement with an algorithm for securing the data packets. The use of neural network provides secured data packets at destination node but a limitation will arise. The ZigBee network has performed well in many sectors without the use of any security algorithm. One of the sectors is less power consumption. If neural network is combined with existing technology then the power consumption will increase and life of whole network will decrease as compared to existing network.

VII. CONCLUSION

ZigBee has its unique features like low cost, low data rate, and low power consumption in market of many wireless networks. In this paper a proposed technology is discussed in field of defense. The fusion of three emerging technologies – WSN, RFID and Neural networks that can give full play to the merits of three technologies complement with each other. It gives most perfect method for security in the field of defense and any remote area where the reaching possibility of human body is very less. Wireless sensor network technology is discussed along with helping algorithms and it is sure that WSN with other technique will work like an emerging technology.

VIII. REFERENCES

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