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THE EFFICIENT CHANNEL SENSING SCHEME FOR WIRELESS BODY AREA NETWORK: A RESEARCH PAPER

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Abstract: The Wireless body area network lies under body or skin of the person which is connected through independent nodes for example actuators. The nodes are connected through a wireless network communication channel which expand over the whole human body. A wireless body area network is useful in many modern-day applications in the field of remote health monitoring, medicine, sports, etc. By efficient channel sensing we mean the method of collecting source information required for the wireless body area network.

Keywords: wban, sensors, healthcare, medical.

I. INTRODUCTION

Miniature low-power sensor nodes are put around a patient's body in a wireless body area sensor network (WBAN) to monitor their biological functions and the surrounding environment. A patient's health information, such as temperature, respiration, heart rate, pulse oximeter, blood pressure, blood sugar, and pH, can be remotely monitored with the use of a WBAN. This information must be continuously processed in real time to gain maximum benefit. To make essential decisions like clinical diagnosis and emergency medical responses, medical information must be shared and accessed by multiple levels of users such as healthcare personnel, researchers, government organizations, and insurance firms.

Because inaccurate or unauthenticated medical information might lead to improper treatments or diagnoses for patients, verified medical data transmissions are a must for a WBAN. As a result, in order to preserve patient privacy, transmitted data must be encrypted. Furthermore, the medical personnel at the institution that gathers the data must be confident that the information is accurate and that it came from the patient who was identified. Security, robustness, and scalability are the primary challenges with a WBAN. The bio-sensors' size and resource limits are also important factors in the success and dependability of a WBAN. To make crucial judgments, information must be shared and accessed by multiple levels of users, such as healthcare professionals, researchers, government organizations, and insurance firms.

II. RELATED WORKS AND MOTIVATION

The most common uses of a WBAN are in the healthcare industry. This is a very delicate situation. As a reason, the MAC protocols proposed for a WBAN must be handled with caution. Several elements influence the design of a MAC protocol for a WBAN. Multiple writers have recently proposed an energy-efficient architecture that utilizes reduced latency. Using the demand and deny time slot allocation scheme, the authors proposed a distributed queuing body area network (DQBAN) MAC protocol. They used a cross-layer fuzzy-rule scheduling algorithm that causes a node to send a packet in the next frame instead of the first frame, resulting in better reliability. The evaluation shows a better packet success rate. MAC protocols using a hybrid wake up mechanism try to take advantage of both scheduled and unscheduled wake ups. An example of a hybrid wake up MAC is the IEEE802.15.4 MAC.

III. COMMUNICATION PROCESS

The wakeup radio is used to start the process of waking up. The communication process is divided into 2 stages. The wake-up radio is turned on in Stage 1. After establishing that it is the intended recipient, the receiver node can send a response to the sender over the same channel. If data communication is needed, the primary radio transceivers are turned on in Stage 2. We've shown the case of an emergency wake-up instruction (emergency alarm) packet in the first scenario. This procedure is conducted during Stage 1. It can be used to alert people to different types of emergencies, which the receiver can learn about by looking at pre-defined material in the wake-up message.

IV. NETWORK SETUP

The address of a node is used in a typical wake up transmission, as seen in Figure 1. Frame header, address, payload, and frame check sequence (FCS) using the cyclic redundancy code (CRC) technique are the fields in the wakeup packets. A prologue and a start panel delimiter are also included in the frame header (SFD). They aid in the detection of errors and false positives, as well as providing synchronization. The intended receiver is identified by the node address or ID. The information about the events is stored in the payload. Figure 2 displays additional MAC frames used for simulation. For multiple packet transmission, we used the "additional data" option. For more data packets, one bit is utilized to demonstrate a basic yes/no. The payload field determines the size of the final packet.

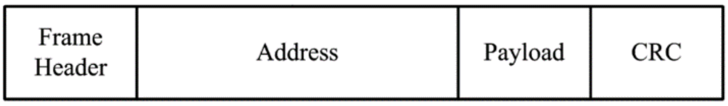

Figure No.1

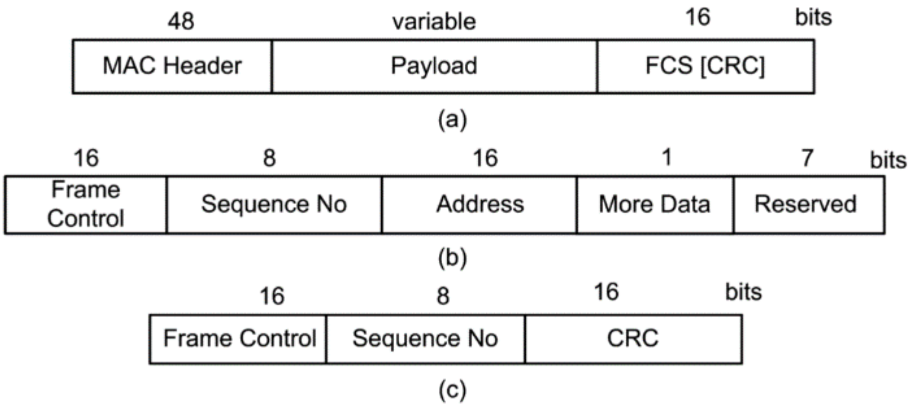

Figure no.2

V. CHANNEL SENSING AND ESTIMATION

In wireless communication systems, accurate awareness of channel impulse response functions is often required for optimal demodulation and decoding. An impulse response is typically calculated by testing the channel with known training waveforms and comparing broadcast and received signals. The relevance of channel identification is emphasized by the fact that this topic has a large number of research publications dedicated to it. This channel identification has two main features which are Sensing and estimate are the issues at hand. Sensing is related to perception to the creation of waveforms for probing the channel. The task of processing the input probe and making an estimate is known as estimation. To retrieve the impulse response, use the channel output the capacity to be precise.

VI. CONCLUSION

Traditional medical models are witnessing a change as a result of the adoption of wearable gadgets. WBAN has the potential to not only relieve individuals from traditional hospitals and clinics, but also to reduce the burden of disease management, particularly for patients with chronic diseases like diabetes and hypertension. Security, efficiency, adaptability, and usability must all be balanced in future systems.

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REFERENCES

[1]https://www.sciencedirect.com/science/article/pii/S1319157813000360

[2]https://www.mdpi.com/1424-8220/15/12/29819/htm

[3]https://nwak.ece.wisc.edu/ciss08.pdf

[4]https://www.scirp.org/journal/paperinformation.aspx?paperid=76200

[5]https://www.sciencedirect.com/topics/engineering/body-sensor-network

[6]https://www.techsparks.co.in/thesis-in-wireless-body-area-network/