

Authentication Healthcare Scheme in WBAN

Abdullah Mohammed Rashid¹, Ali A. Yassin *², Abdulla J. Y. Aldarwish², Aqeel A. Yaseen³, Hamid Alasadi², Ammar Asaad², Alzahraa J. Mohammed²

¹Department of Computer, Education College for Human Science, University of Basrah, Basrah, Iraq

²Department of Computer Science, College of Education for Pure Sciences, University of Basrah, Basrah, Iraq

³Ministry of Education, Basrah, General Directorate of Education in Basrah, Iraq

Correspondance

*Ali A. Yassin

Computer Science,

College of Education for Pure Sciences,

University of Basrah, Basrah, Iraq

Email: aliadel79yassin@gmail.com

Abstract

A wireless body area network (WBAN) connects separate sensors in many places of the human body, such as clothes, under the skin. WBAN can be used in many domains such as health care, sports, and control system. In this paper, a scheme focused on managing a patient's health care is presented based on building a WBAN that consists of three components, biometric sensors, mobile applications related to the patient, and a remote server. An excellent scheme is proposed for the patient's device, such as a mobile phone or a smartwatch, which can classify the signal coming from a biometric sensor into two types, normal and abnormal. In an abnormal signal, the device can carry out appropriate activities for the patient without requiring a doctor as a first case. The patient does not respond to the warning message in a critical case sometimes, and the personal device sends an alert to the patient's family, including his/her location. The proposed scheme can preserve the privacy of the sensitive data of the patient in a protected way and can support several security features such as mutual authentication, key management, anonymous password, and resistance to malicious attacks. These features have been proven depending on the Automated Validation of Internet Security Protocols and Applications. Moreover, the computation and communication costs are efficient compared with other related schemes.

Keywords

WBAN, healthcare, sensitive data, mutual Authentication, AVISPA.

I. INTRODUCTION

With the rapid growth of the Internet, the Internet of Things (IoT), cloud computing, and the usage of wireless networks in the daily lives, life has become easier. IoT services are almost boundless, as they fuse the real and Internet worlds. The IoT has applications that can be found in several areas, such as smart cities, vehicle networks, and healthcare systems [1]. Currently, information technology plays the primary role in expense pressure, as keeping an eye on the health state of a patient remotely is now possible, thus avoiding hospitalization [2, 3]. A WBAN considers a part of a wireless sensor network that is applied in several areas, including comprehensive healthcare, according to its ability to observe the patient's health information to follow the health cases of a customer

that leaves the health care center. However, the applications of WBAN are numerous in other fields, such as GPS and E-bank [4, 5, 6, 7]. Generally, a WBAN consists of biometric sensors suitable for collecting health information by measuring vital signals from the human body[8]. These biometric sensors can send vital signals to a personal device (a smart mobile phone or a portable computer), which connects to an authentication server. This server is able to take necessary actions in emergency situations as well as saves the patients' information on a secure database [9]. Figure 1 shows the central organization of a WBAN. Much like other wireless networks, the WBAN suffers from information security, data integrity, and availability challenges. The data of WBAN are transferred via a normal channel. Therefore, it is in jeopardy of security problems and



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