Energy-efficient Cluster-based Mechanism for WBAN Communications for Healthcare Applications

Abstract

Wireless body area networks (WBANs) are formed with the help of tiny health monitoring sensors on the human body in order to collect and communicate the human personal data. WBANs provides a solution to facilitate the tasks performed in the medical sector, and minimize the chances of errors during the process of medical diagnosis. However, using an expensive key management method is not feasible in highly resource-constrained WBANs. Therefore, we propose and evaluate an energy-efficient key management scheme for WBANs that takes into account available resources of a node during the whole life cycle of key management. Our proposed scheme is a cluster-based hybrid security energy efficient framework. By using multiple clusters, energy-efficiency can be ensured. The performance comparison of our proposed cluster-based key management scheme and low-energy adaptive clustering hierarchy (LEACH)-based key agreement scheme and energy – efficient mechanism shows that the proposed scheme is more energy-efficient, and provides better network lifetime.

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**Index Terms**

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Keywords

Wireless Body Area Network (WBAN)  Energy-efficient  Clustering  IEEE 802.15 LEACH.