Improvements of Energy-Efficient Techniques in WSNs: A MAC-Protocol Approach

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The pervasiveness of wireless sensor networks (WSNs) across different applications keeps increasing due to their versatility, although energy consumption is a huge constraint for these types of networks. Therefore, it is essential to incorporate consistent and reliable energy sources. Mobile nodes require independent sources, often composed of a battery with one or more energy harvesting devices (EHDs). The exigency for energy-efficiency improvements is a collateral effect of the growth of WSNs. Different methods have been proposed to improve the energy efficiency of these systems. This paper focuses on the techniques of energy-efficiency developed in the medium access control (MAC) layer. The proposed solution incorporates EHDs and analytic information, such as the estimation of the network lifetime, to achieve an energy efficient system, potentially self-sustainable. A widely used MAC-protocol technique for energy conservation is duty cycling, because it facilitates