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Abstract

Recent research has revealed that substantial percentage of the links in realistic Heterogeneous Wireless Sensor Networks (HWSNs) are asymmetric. Discovering and exploiting asymmetric links efficiently pose subsequent challenges in designing the wireless sensor networks routing protocols. In this paper we propose ERPPro, an Energy Efficient Reverse Path Routing Protocol scheme to discover and exploit asymmetric links in WSNs. ERPPro performs an intelligent computing by analyzing the unequal proportionate link state to select the best energy efficient reverse route among multiple paths. It applies the exponential upper bound value for calculating the average mean and variance of residual energy along with link quality of forwarding nodes to select a legitimate reverse route. Simulations were conducted to verify ERPPro’s performance. From the simulation results it is observed that the proposed scheme is able to achieve higher delivery ratio reducing significant number of duplicated packets. Moreover, the mechanism was able to find more asymmetric links and maintain them with minimal overhead. Overall when energy reduces across sensors, performance of ERPPro degrades more slowly consuming only moderate energy resulting in prolonged network lifetime.
Keywords: Wireless Sensor Network, Energy Efficient, Routing Protocol, Reverse Path, Asymmetric links.

References


