

Distance based thresholds for 2-tier relay nodes selection in WSN

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ABSTRACT

Relay selection technique approaches are increasingly used to improve the reliability of Wireless Sensor Networks (WSNs) communication, thus providing energy efficiency and reducing energy consumption. Due to the adoption of direct transmission from Cluster Heads (CHs) to the Base Station (BS), faster energy depletion may arise. Hence, the deployment of proper relay nodes techniques in WSN is a crucial task. This paper proposed, implemented and evaluated a new technique for the selection of relay nodes according to the nearest distance with Base Station (BS) in a 2- tier network. The selection was performed using K-Optimum that target the selection of the nearest number of relay nodes and, at the same time, ensure that all CHs are connected to at least one corresponding relay node based on K-Mean approach. Simulation results show that the distance based threshold for relay nodes selection implemented in Relay Access Protocol (RAP) performs better than the Multi-Tier Protocol (MAP) and Stable Election Protocol (SEP) protocols in terms of First Node Dead (FND), Last Node Dead (LND) and network lifetime.

KEYWORDS

Wireless sensor network; Relay selection; Residual energy; Energy efficiency; Network lifetime

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