An Energy-Efficient Clustering with Mobile Sink and Rendezvous Nodes for Data Collection in IoT-based Wireless Sensor Networks

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Abstract:
The inclusion of mobile sink(s) and rendezvous nodes has facilitated the data collection in Internet-of-Things-based wireless sensor networks to a great extent. In the sink-mobility-based clustered network enriched with rendezvous nodes, normal sensor nodes do not require to transmit their readings to the distant base station. Instead, they can transmit their data to the nearby mobile sink/rendezvous nodes saving their respective limited energy. Such a facility allows the saved energy to be utilized in further network operations, prolonging the overall network lifetime. However, clustering the nodes leading to energy-efficient operations in the aforementioned network scenario is still a challenging task. In this work, an existing scheme optimized-LEACH has been improved by formulating energy-aware clusters in the network. Various simulations establish the supremacy of the proposed scheme in terms of nodes' decay rate, average energy per node in the network, throughput, and nodes' distribution in the clusters. Experiments confirm that the proposed scheme achieves gains up to 167.56% in data packet delivery under varying network configurations.

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Contents

Back to Results