Steiner trees grid routing protocol in wireless sensor networks

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Abstract

In a wireless sensor network, it is an important task to periodically collect data from an area of interest for time-sensitive applications. The sensed data must be gathered and transmitted to a base station for further processing to meet the end-user queries. Since the network consists of low-cost nodes with limited battery power, it is a challenging task to design an efficient routing scheme that can collect massive data and offer good performance in energy efficiency, and long network lifetimes. Grid structure was proposed for energy efficient data routing. Instead of propagating query messages from sink to all sensors to set up data forwarding information, the grid structure uses only sensors located at the grid points needed to acquire the forwarding information. In this paper, we propose an energy-efficient routing technique, called Steiner Trees Grid Routing (STGR) protocol, to improve the performance of previous grid routing protocols. Simulation results show that STGR achieves a better solution in data delivery and therefore ensures more energy efficient of data transmission in wireless sensor networks.

Keyword：Wireless sensor networks, grid routing, Steiner trees