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(57) Abstract :

Abstract:Sensor nodes that are dispersed geographically and operate together to monitor environmental or physical variables make up wireless sensor networks, or WSNs. Because sensor nodes in WSNs have limited energy and bandwidth resources, efficient data transmission is essential. A key component of network performance optimization is convergecast, a data collection method that aggregates data from several sources and sends it to a central sink. With an emphasis on energy efficiency and lower latency, this study suggests a spanning tree-based technique for Data Aggregation Enhanced Convergecast (DAC). Through the construction of efficient spanning trees that take into account network topology and energy restrictions, the suggested approach balances the communication load and reduces redundant transmissions. In comparison to conventional convergecast systems, simulation findings show that the DAC approach greatly increases network lifetime, lowers end-to-end delay, and improves total data aggregation efficiency.

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