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CGR: Centrality-based green routing for Low-power and Lossy Networks

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Abstract

High throughput and energy are two important constraints of the Low-power and Lossy Network (L2N). We propose Centrality-based Green Routing for L2Ns (CGR) as a routing protocol that considers both centrality and energy to improve network performance and decrease power consumption. CGR is a collection routing protocol that combines the best features of both protocols Collection Tree Protocol (CTP) and Centrality Tree (CT). CGR uses centrality betweenness-based to choose intermediate nodes that can perform data fusion and employ Link Quality Estimation (LQE) to find routes of high throughput and delivery rate. The suitable combination of these techniques leads the protocol to improve the literature results in delivery rate, energy consumption, and time to deliver data. There is a trade-off by routing through central nodes and their power consumption. Thus we also propose a Policy-Aware algorithm to balance energy consumption and to increase the network lifetime.

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Keywords

Sensor network; Routing; Wireless communication; Centrality

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