

无线传感器网络中基于链路层服务的最可靠路由路径建立算法

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摘要

无线传感器网络中, 链路通信质量随时空变化很大, 并且有5%到15%的非对称链路存在. 链路层服务不但可以发现邻居传感器节点, 测量和预测邻居节点间的链路通信质量, 而且还能提供链路数据转发机制减轻单向链路对其他协议的影响. 为了进一步提高路由路径的可靠性和减少能量损耗, 本文利用链路层服务, 采用分布式算法, 为每个传感器节点建立了到汇聚节点的最可靠路由路径, 并理论分析该算法的性能, 最后在无线传感器网络模拟器TOSSIM上进行了模拟. 实验结果表明, 基于链路层服务的最可靠路由路径建立算法, 可充分利用单向链路建立更可靠的路由路径, 有多于17%的节点建立了更可靠的路由路径, 路由路径的可靠性提高了2%到51%.

关键词 [无线传感器网络](#) [链路层服务](#) [链路数据转发机制](#) [最可靠路由路径算法](#)

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Building the Best Reliable Routing Tree Using Link Quality Services in WSNs

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Abstract

A recent study in wireless sensor networks (WSNs) has found that the link quality varies significantly with spatial and temporal factors and approximate 5% to 15% of all links are asymmetric links. The link quality services are used to measure and estimate the link quality between neighbors and provide the link layer relay mechanism to mitigate the effects of the unidirectional links. In order to provide the best reliable routing tree and reduce energy consumption, we developed a distributed algorithm to build the best reliable routing tree for every node using the link layer services. From statistic analysis and simulation using TOSSIM, we find that the algorithm can prevent from building a broken routing tree and build a more reliable routing tree. More than 17% nodes have built more reliable routing tree and the percentage of the improved reliability is about 2% to 51%.

Key words [Wireless sensor networks](#) [link quality services](#) [link relay mechanism](#) [algorithm to build the best reliable routing tree](#)

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