

基于速率调整和区分服务的WSN QoS机制

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摘要：

基于排队论对多跳线性拓扑结构的无线传感器网络QoS进行了建模和分析，提出了非端到端的集体数据丢包率CDL和时延CDD的QoS指标的具体公式。进而提出从Sink节点开始逐级减少的速率调整算法来保证网络QoS。又引入“区分服务”到本文模型，提出了基于抢先优先制的PPS调度算法以实现不同的业务有不同QoS参数。仿真表明，速率调整算法能明显提高网络的QoS性能，CDL下降达23.0%~100%，CDD最多减小89.6%，而PPS算法在重要数据的时延CDD和网络抖动等C参数上明显优于SATS算法，从而更好地实现了“区分服务”的QoS机制。

关键词：无线传感器网络；服务质量；排队系统；速率调整；区分服务

The QoS Mechanism of WSN Based on Rate Adjustment and DiffServ

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Abstract:

The modeling and analysis of QoS of a multi-hop WSN consisting of clusters arranged linearly are performed by employing the queueing theory. Formula of non-end-to-end QoS parameters called CDL (Collective Data Loss) and CDD (Collective Data Delay) are given. Furthermore, a rate adjustment algorithm by reducing the data generating rate at the clusters from the sink is proposed to ensure the QoS. In order to adopt "DiffServ", a preemptive priority scheduling algorithm called PPS is proposed so that different services have different QoS. The result of the simulation proves that the rate adjustment algorithm has improved the QoS so much that the CDL decreased by 23.0%~100% and the maximum reduction of CDD is up to 89.6%, meanwhile the PPS scheduling algorithm has realized the "differentiated services" QoS mechanism better than SATS algorithm in ensuring the important data's CDD and the low network jitter.

Keywords: WSN; QoS; Queueing System; Rate Adjustment; DiffServ

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