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网络、通信、安全

无线传感器网络自适应MAC协议

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摘要 提出了一种根据无线传感网络流量自动调节节点睡眠-活动时间比例的MAC协议-ATMAC，在无线传感器网络TMAC协议的基础上，以低能耗、低延迟为目标，主要采用自适应、多级别的占空比及自适应竞争窗口，数据优先级队列使节点在流量较小时能更多地处于睡眠状态以节省能量，而在流量较大时，传输所涉及的节点可相对长时间地进入活动状态，且大流量和小流量节点所采取的占空比可以不同，从而节省低流量节点用于空闲侦听的能耗，降低数据传输的延迟，增大网络的吞吐量。仿真结果显示新协议在能量消耗、数据延迟等方面要超过TMAC。

关键词 MAC协议 低能耗 低延迟 占空比 无线传感器网络

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Adaptive MAC protocol for wireless sensor networks

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Abstract

This paper proposes a new MAC protocol，ATMAC which can be adaptive to the traffic load.Based on the TMAC protocol，aimed to low energy consumption，low latency，several scheme is used to make nodes sleep more when their traffic is lower，while be awake more when their traffic is high，such as adaptive duty-cycle，adaptive contention window，and privileged data transfer queue.Moreover，the duty-cycle of nodes refer to in low and high traffic can be different even they are in one virtual cluster.So the energy consumption of idle listening and latency can be reduced while increasing the throughput.The simulation results with ns-2 show that ATMAC outperform TMAC in energy consumption and latency.

Key words MAC low energy consumption low latency duty-cycle wireless sensor networks

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