

稿件编号：JCST-1402-3643

Title: SA-MAC: Self-stabilizing Adaptive MAC protocol for Wireless Sensor Networks

中文题目：无线传感器网络的自适应介质访问控制层协议

Abstract: A common method of prolonging the lifetime of wireless sensor networks is to use low power duty cycling protocol. Existing protocols consist of two categories: sender-initiated, and receiver-initiated. In this paper, we present SA-MAC, a Self-stabilizing Adaptive MAC Protocol for wireless sensor networks. SA-MAC dynamically adjusts the transmission time-slot, waking up time-slot, and packet detection pattern according to current network working condition, such as packet length and wake-up patterns of neighboring nodes. In the long run, every sensor node will find its own transmission phase so that the network will enter a stable stage when the network load and qualities are static. We conduct extensive experiments to evaluate the energy consumption, packet reception rate of SA-MAC in real sensor networking systems. Our results indicate that SA-MAC outperforms other existing protocols.

中文摘要：

通常对于延长无线传感器网络的生存时间的通用做法是使用低功耗占空比协议。现有的方法主要分为两种，发送者触发模式和接收者触发模式。在本文中，我们为无线传感器网络提出一种自适应的介质

访问控制层协议。该协议根据当前网络工作状况，例如数据包长度，邻居节点唤醒模式等，动态调节数据包发送时间槽，唤醒时间槽和数据包监测模式。从长远来看，每个传感器节点都会找到自己的数据包传输模式，使得在整个网络负载和节点数量不变的情况下进入一个稳定的状态。我们进行了丰富的实验，在真实的无线传感器网络中来检验能耗和数据包接受成功率。实验结果表明我们的自适应的介质访问控制层协议性能优于现有的协议。

Keywords: Duty Cycling Protocol, sender-initiated, receiver-initiated, SA-MAC

中文关键词：占空比协议，发送者触发，接收者触发，自适应的截至访问控制层协议