

## 一种自适应侦听的异步无线传感器网络MAC协议

陈德富\* 陶正苏 朱建平\*

上海交通大学仪器系 上海 200240

## An Adaptive Polling Periods MAC Protocol for Wireless Sensor Networks

Chen De-fu Tao Zheng-su Zhu Jian-ping\*

Department of Instrument Science and Engineering, Shanghai Jiaotong University, Shanghai 200240, China

摘要

参考文献

相关文章

Download: PDF (233KB) [HTML](#) 1KB Export: BibTeX or EndNote (RIS) [Supporting Info](#)

**摘要** 为了提升异步无线传感器网络MAC协议在动态网络负载下的性能, 论文提出了一种流量自适应的异步协议AA-MAC。该协议基于短前导序列采样技术, 当节点收到数据后并不理解转入睡眠而自适应增加若干个最短侦听时间用以接收发送节点的可能其他数据, 使得收发双方在网络负载较重时能实现一次配对对多次收发数据。分析并对比了AA-MAC和X-MAC的能耗和延时模型。在一个9跳线形拓扑网络上的仿真结果表明: AA-MAC在各种负载下性能均优于S-MAC; 当网络负载很轻时, AA-MAC表现和X-MAC相当; 随着网络负载加重, AA-MAC和X-MAC能耗相当但延时减少了56%以上。

**关键词:** 无线传感网络 前导序列 自适应 媒体接入控制(MAC)

**Abstract:** To improve network performance in dynamic traffic load conditions, an adaptive polling periods MAC protocol called AA-MAC is proposed. Based on short preamble sampling technology, after receiving messages rather nodes in AA-MAC perform some additional polling periods than switch off radios immediately. It allows several transmissions upon one rendezvous between the sender and its destination especially when network traffic is high. To give insight into protocol, energy consumption and network latency are both modeled. Simulations on a 9 hop linear topology illustrate that AA-MAC is superior to S-MAC in any traffic conditions and it performs equally to X-MAC in light traffic conditions and performs better than X-MAC in high traffic conditions. When traffic load is high, AA-MAC decrease network latency by 56% compared to X-MAC.

**Keywords:** Wireless sensor networks Preamble Adaptive Media Access Control (MAC)

Received 2010-10-15;

**本文基金:**

国家科技支撑计划(2006BAK03A17)资助课题

**通讯作者:** 陈德富 Email: defuchen@sjtu.edu.cn

**引用本文:**

陈德富, 陶正苏, 朱建平. 一种自适应侦听的异步无线传感器网络MAC协议[J] 电子与信息学报, 2011, V33(6): 1290-1293

Chen De-Fu, Tao Zheng-Su, Zhu Jian-Ping. An Adaptive Polling Periods MAC Protocol for Wireless Sensor Networks[J], 2011, V33(6): 1290-1293

**链接本文:**

<http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2010.01106> 或 <http://jeit.ie.ac.cn/CN/Y2011/V33/I6/1290>

### Service

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [Email Alert](#)
- ▶ [RSS](#)

### 作者相关文章

- ▶ [陈德富](#)
- ▶ [陶正苏](#)
- ▶ [朱建平](#)