

C-cast: 传感器网络中无位置数据分发和发现技术

作者: 李志刚, 吴君青

单位: 解放军理工大学指挥自动化学院计算机系

基金项目: 江苏省自然科学基金项目

摘要:

在无线传感器网络中,基于对等节点的数据分发和发现技术是一项关键的工作和研究问题.现有的研究技术和协议设计多数依赖于节点的位置信息,但是在传感器网络中节点获取位置信息需要精确的定位算法和大量的计算、通信开销.为满足在没有位置信息的情况下,节点依然能够有效地进行数据分发和发现工作,本文提出了C-cast协议. C-cast协议不仅不依赖于精确的物理位置信息和大功耗的定位服务,而且节点不需要存储维护太多的全局拓扑信息.本文证明了在稠密网络的理想模型下,C-cast协议能够达到100%的数据查询成功率;在随机模型下,通过选择跳步距离适当的两个信标节点,C-cast协议能够达到80%以上的实际数据查询成功率.本文测试了C-cast协议的三种性能,包括数据查询成功率、存储代价和负载均衡.测试结果显示C-cast协议达到甚至超过基于位置信息的协议性能.

关键词: 无线传感器网络; 数据存储发现; 数据查询; C-cast

C-cast: A Location-free Data Dissemination and Discovery Approach in Sensor Networks

Author's Name:

Institution:

Abstract:

Peer-to-peer data dissemination and discovery is critical for ad-hoc wireless sensor networks. Most existing research depends on location information that is not always obtained easily, efficiently and accurately. We propose the concept of C-cast, a location-free data dissemination and discovery approach for large-scale wireless sensor networks. One important property of C-cast is that it does not depend on physical position or accurate localization services. The other advantage is that each node needs not to maintain too much global topology information. We prove that under the ideal scenario, C-cast can achieve 100% data retrieval success ratio, while under the random scenario, it can achieve 80% in reality. We evaluate C-cast thoroughly using metrics including data retrieval success ratio, storage cost, and load balance. Evaluation results show that C-cast can reach comparable functionalities and performance as the other approaches with physical location information.

Keywords: sensor networks, data-centric storage and discovery, data retrieval, C-cast

投稿时间: 2012-01-21

[查看pdf文件](#)