

有效支持智能天线的MANET邻结点发现算法与分析

赵瑞琴¹,文爱军¹,刘增基¹,杨君刚^{1,2}

(1. 西安电子科技大学 综合业务网理论与关键技术国家重点实验室, 陕西 西安 710071;2. 西安通信学院, 陕西 西安 710106)

收稿日期 修回日期 网络版发布日期 2007-5-31 接受日期

摘要

为了能够充分利用定向传输给MANET性能提升带来的优势,提出了两种采用定向天线的MANET的邻居发现算法——非辅助TD模式的定向邻居发现算法与非辅助TRD模式的定向邻居发现算法.利用定向扫描来模拟全向的思想,实现了在不依赖GPS或其他辅助信息的前提下独立完成MANET的邻结点发现,使通过采用定向天线提升MANET网络容量成为可能.以载波侦听多址接入/冲突避免机制为基础,结合该算法计算无ACK回复的DCF基本接入的帧服务时延,得出一次邻居发现所需的发现时间及邻居发现概率,并通过仿真得到了验证.该算法与现有其他算法的最大区别是,不需依赖GPS或其他辅助信息就能独立实现邻居发现.

关键词 [移动ad hoc网络](#) [定向天线](#) [波束扫描](#) [邻居发现](#)

分类号 [TN929.5](#)

Study of neighbor discovery in wireless ad hoc networks with smart antennas

ZHAO Rui-qin¹,WEN Ai-jun¹,LIU Zeng-ji¹,YANG Jun-gang^{1,2}

(1. State Key Lab. of Integrated Service Networks, Xidian Univ., Xi'an 710071, China; 2. Xi'an Communication Institute, Xi'an 710106, China)

Abstract

<P>To obtain potentials offered by directional antennas which can increase the transmission range of a single hop, reduce interferences, improve the spatial reuse and then expand the capacity of the networks obviously, we propose two new directional neighbor discovery algorithms for MANET. The first is the Transmit Directionally only (TD) mode of the neighbor discovery algorithm with directional transmitting and omni-directional receiving. The second is the Transmit and Receive Directionally (TRD) mode of the neighbor discovery algorithm with directional transmitting and directional receiving. The two algorithms utilize the idea of imitating omni-directional transmission through circular directional transmission to discover neighbors without GPS or other aided information. Based on the CSMA / CA mechanism, a theoretical analysis of the discovery time and probability for a node to discover all neighbors are made, which is validated by NS-2 simulations. The key feature of the algorithms is accomplishing neighbor discovery without any assisted service such as GPS, time synchronization, etc.

</P>

Key words [mobile ad hoc network](#) [directional antenna](#) [beam scanning](#) [neighbor discovery](#)

DOI:

通讯作者

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(199KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“移动ad hoc网络”的相关文章](#)

▶ [本文作者相关文章](#)

· [赵瑞琴](#)

· [文爱军](#)

· [刘增基](#)

· [杨君刚](#)

·