



基于频率域多目标MANETs可信路由决策研究

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Research on MANETs Trusted Routing Decision Based on Multi-objective in Frequency Domain

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摘要 移动Ad-hoc网络(MANETs)具有开放的媒质, 动态的拓扑结构, 分布式的合作和受限的网络能力等基本特点。网络中移动节点具有匿名性和高度自治的特点, 网络通讯依靠在通信路径上的中间节点转发数据包, 实现无线传输范围外节点间的正常通信。该文提出了一种独特的MANETs中基于频率下多目标可信路由决策算法, 它和现在大多数路由算法都是在时间域下使用单一约束参数选择路由的方式截然不同。利用概率理论分析安全和可信路由, 基于概率密度函数的时频相互转化, 减小计算复杂度, 解决MEANTs中节点间缺乏物理安全以及在低信任水平和节点相互勾结扰乱网络操作情况下, 发现可信安全路由难的问题。实例分析证明了此算法的可行性。

关键词: 移动自组织网络 可信路由 频率域

Abstract: Mobile Ad-hoc Networks (MANETs) have their fundamental characteristics, such as open medium, dynamic topology, distributed cooperation, and constrained capability. Due to the anonymous and self-organization nature of mobile nodes in the network, intermediate nodes on a communication path are expected to forward packets of other nodes so that nodes can communicate beyond their wireless transmission range. In this paper, a trusted routing selection algorithm based on multi-objectives in frequency-domain for MANETs is proposed. It is distinctly different with most of routing algorithms that select routing based on a single-objective in the time-domain. The proposed algorithm tries to analyze the secure and trusted routing based on probability theory to reduce the computation complex with the mutual transformation of probability functions between time-domain and frequency-domain. It solves the problem of finding secure and trusted routing for MANETs in the case of the lack of physical security, untrustworthy scenario and low trust levels among nodes in MANETs and malicious nodes colluding with one another to disrupt the network operation. Extensive analysis is carried out to evaluate the design of the algorithm.

Keywords: Mobile Ad-hoc NETWORKS (MANETs) Trusted routing Frequency-domain

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