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Ad hoc网络中一种基于信任的机会路由算法

Opportunistic routing algorithm based on trust model for ad hoc network

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中文关键词: [信任相似性](#) [信任模型](#) [信任度](#) [机会路由](#) [机会路由成本](#)

英文关键词: [trust-based similarity](#) [trust model](#) [degree of trust](#) [opportunistic routing](#) [cost of opportunistic routing](#)

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| 作者 | 单位 |
| 王博, 陈训逊 | 国家计算机网络应急技术处理协调中心, 北京 100029 |

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中文摘要:

由于ad hoc网络具有缺乏足够的物理保护、拓扑结构动态变化、采用分布式协作、节点的带宽和计算能力有限等特点, 导致传统的路由安全机制不再适合ad hoc网络路由协议的设计。最近当前研究热点之一的机会路由能够在链路不可靠的情况下充分利用无线广播和空间多样性的特性提高网络的吞吐量。因此, 考虑在机会路由中引入信任相似性概念设计信任机会路由, 建立了基于节点信任度和最小成本的信任机会转发模型, 提出了最小成本的机会路由算法MCOR, 并对算法进行了理论上的分析和证明。最后采用仿真实验对该算法进行验证, 又与经典机会路由协议ExOR以及其他经典的信任路由协议TAODV和Watchdog-DSR进行性能对比。仿真结果表明, MCOR算法能够防范恶意节点的攻击, 在吞吐量、端到端时延、期望转发次数(ETX)和成本开销等方面都比其他3种协议表现出性能上的优势。

英文摘要:

Due to the absence of enough physical protection, dynamic topology, distributed collaboration, the limited bandwidth and computing ability in ad hoc network, traditional routing security mechanism cannot adapt to the design of routing protocols. Recently, opportunistic routing is one of the research hotspots, which can cope with the unreliable transmissions to improve throughput of the whole network by exploiting the broadcast nature of the wireless medium and spatial diversity of multi-hop wireless network. The concept of trust-based similarity in opportunistic routing for ad hoc network was incorporated, and a novel trusted opportunistic forwarding model based on trust degree of node and least cost of opportunistic routing were also built. Then a trusted minimum cost routing algorithm (MCOR) was proposed and the correctness and effectiveness of this algorithm from theoretical analysis were proved. Finally, MCOR algorithm was verified by simulation and was compared with the classic protocols: ExOR, TAODV and Watchdog-DSR. The simulation results show that MCOR scheme can detect and mitigate node misbehaviors. Furthermore, MCOR scheme outperforms the other protocols in terms of throughput, delay, expected ETX and cost of routing.

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