

Ad hoc网络基于协同的可靠组播丢失恢复算法设计

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CoreRM: Cooperative Loss Recovery for Reliable Multicast in Ad hoc Networks

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摘要 在Ad hoc网络中保证组播通信的可靠性要面对Ad hoc网络高误码率、带宽受限、节点能量有限和拓扑结构频繁变化等技术挑战。该文将协同的思想引入到组播丢失恢复设计中，设计了新的基于协同的可靠组播丢失恢复算法(CoreRM)。根据各个节点经历的不同丢失情况，通过自适应选择本地恢复、全局恢复或发送端恢复，分布式地处理整个网络的丢失恢复。CoreRM还设计了恢复路径缓存、NAK抑制机制，以及源路由数据包(SPM)发送机制来应对Ad hoc网络中的拓扑变化。性能分析和NS2的仿真实验表明相对于UDP和PGM可靠组播通信，CoreRM算法可以在网络吞吐量和丢失恢复延时方面有显著性能改善。

关键词: Ad hoc网络 可靠组播 协同通信 丢失恢复

Abstract: Reliable multicast in Ad hoc networks is challenging due to high error rate, low bandwidth, limited node power, and highly dynamic topology changes. In this paper, an efficient loss recovery scheme is proposed for reliable multicast (CoreRM). The basic idea is to apply the notion of cooperative communication to support local loss recovery. According different packet loss cases, CoreRM tries to retrieve the lost packet through progressively cooperating with neighboring nodes, upstream nodes or source node. In order to minimize recovery latency and retransmission overhead, CoreRM caches not only data packets but also the path which could be used for future possible packet recovery. In CoreRM, upstream nodes suppress duplicate NAKs to tackle feedback implosion. Both analytical and simulation results reveal that CoreRM significantly improves the multicast performance in terms of throughput and recovery latency compared with UDP and PGM.

Keywords: Ad hoc networks Reliable multicast Cooperative communication Loss recovery

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