

Routing information rebroadcasting algorithm to minimize routing cost in mobile ad hoc networks

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Abstract: This thesis proposes a novel rebroadcasting algorithm designed to minimize routing costs in mobile ad hoc networks (MANETs). Traditional flooding-based route discovery generates significant overhead, leading to redundant transmissions, contention, and packet collisions, which degrade network performance. The proposed algorithm addresses this by leveraging a dynamic probabilistic rebroadcasting mechanism. It utilizes local neighbor density and a novel cost metric to calculate a rebroadcast probability for each intermediate node. Nodes with higher connectivity and lower potential routing cost are assigned a higher probability of forwarding route request packets, while redundant rebroadcasts are suppressed. This selective approach reduces the total number of control packets without compromising route discovery efficiency. Simulation results demonstrate that the algorithm significantly reduces routing overhead and end-to-end delay compared to standard flooding and existing probabilistic schemes, while maintaining a high packet delivery ratio. By minimizing unnecessary retransmissions, the proposed method effectively lowers the overall routing cost, extending network lifetime and improving scalability for dynamic MANET environments.

Keywords: routing cost minimization, ad hoc networks, routing information rebroadcast, MANET