

Research on routing mechanism based on neighbor node connectivity coefficient for mobile ad hoc networks

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Abstract: This study proposes and evaluates a novel routing mechanism for Mobile Ad Hoc Networks (MANETs) based on a neighbor connectivity coefficient. Traditional routing protocols often suffer from high overhead and instability due to frequent topology changes. The proposed mechanism addresses this by dynamically calculating a connectivity coefficient for each node, which reflects the stability and density of its local neighborhood. This coefficient is integrated into the route discovery process to prioritize paths composed of nodes with stronger, more persistent links, thereby reducing route breakages. The protocol was simulated and compared against standard AODV and DSR protocols under various mobility and traffic conditions. Performance metrics, including packet delivery ratio, end-to-end delay, and routing overhead, were analyzed. Results demonstrate that the proposed connectivity-based routing significantly enhances network stability and throughput, particularly in high-mobility scenarios, by effectively selecting more reliable forwarding paths. This approach offers a lightweight and adaptive solution for improving Quality of Service in dynamic MANET environments.

Keywords: routing, connectivity coefficient, neighbor node, mobile ad hoc network