

Research on improving the AOMDV routing protocol to ensure quality of service for MANET

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Abstract: This study proposes an enhanced routing protocol based on AOMDV (Ad hoc On-demand Multipath Distance Vector) to improve Quality of Service (QoS) in Mobile Ad hoc Networks (MANETs). While AOMDV provides multiple disjoint paths to reduce route discovery frequency, it lacks effective mechanisms for QoS assurance under dynamic network conditions. The proposed method integrates link stability prediction and residual energy metrics into the path selection process. By evaluating node mobility and energy consumption, the protocol selects more stable and longer-lasting routes, thereby reducing packet loss and end-to-end delay. Additionally, a load-balancing mechanism distributes traffic across available paths to prevent congestion. Simulation results demonstrate that the improved AOMDV significantly outperforms the original protocol in terms of packet delivery ratio, throughput, and average delay, particularly in high-mobility and high-density scenarios. This research contributes to the development of reliable and efficient routing solutions for QoS-sensitive MANET applications.

Keywords: AOMDV, MANET, QoS, routing protocol