

Research on link quality estimation techniques to improve the routing algorithm for the AODV protocol

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Abstract: This study proposes an enhanced routing algorithm for the Ad hoc On-Demand Distance Vector (AODV) protocol by integrating a link quality estimation technique. Traditional AODV relies on the minimum hop count as the primary metric for route selection, which often leads to unstable paths in dynamic wireless environments due to signal fading and interference. To address this limitation, we introduce a novel link quality estimator that evaluates the stability and reliability of wireless links based on metrics such as received signal strength indicator (RSSI) and signal-to-noise ratio (SNR). This estimator is embedded into the route discovery process, allowing the protocol to select paths with superior link quality rather than merely the shortest hop count. Simulation results demonstrate that the proposed approach significantly improves network performance, achieving higher packet delivery ratios, reduced end-to-end delay, and enhanced route stability compared to the standard AODV protocol. The findings confirm that incorporating link quality awareness into routing decisions effectively mitigates the adverse effects of link failures in mobile ad hoc networks.

Keywords: AODV, link quality, routing, estimation