EMA-MPR: Energy and Mobility-Aware Multi-Point Relay Selection Mechanism for Multipath OLSRv2

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Abstract—In MANETs, data routing is a critical issue due to frequent network's topological changes and the unbalanced load distribution among nodes. The hybrid MultiPath Optimized Link State Routing protocol version two (MP-OLSRv2), which is the most recent and popular protocol proposed in this area, and is represented an effective solution to such issues by providing multiple paths between source-destination pairs. However, MP-OLSRv2 does not consider any parameters related to energy consumption neither in Multi-Point Relay (MPR) selection nor multiple routes computation. Hence, nodes failures due to fast battery depletion restrict their ability to relay packets and degrade the Quality of Service (QoS). In this paper, we propose a new *Energy and Mobility-Aware Muti-Point Relay* (*EMA-MPR*) selection mechanism and extend the conventional MP-OLSRv2 protocol to increase route stability, prolong nodes lifetime and improve the QoS. The performance of the proposed mechanism has been evaluated and compared with the conventional protocol under various simulation scenarios using EXata Simulator. The results prove that the protocol with the proposed *EMA-MPR* mechanism outperformed MP-OLSRv2 under various scenarios.

Keywords - MANET; Energy-Efficient; Mobility-Aware; MP-OLSRv2; EMA-MPR