ACO–EEOLSR: enhanced energy model based link stability routing protocol in mobile ad hoc networks

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Abstract

A mobile ad hoc network (MANET) has abundant mobile nodes that are free to communicate independently in many locations. Many existing energy models address the inadequacy of resources based on Ad hoc On-demand Multipath Distance Vector and Optimized Link State Protocol (OLSP) routing protocols for MANET along with various parameters. The architecture of energy-efficient routing mechanisms is a challenging problem in a MANET. In this work, a novel energy-aware routing model is introduced for MANET comprising an ant colony optimization (ACO) enhanced approach to energy-efficient-optimized link state routing (named ACO–EEOLSR). Initially, the route discovery is progressed by means of neighbor estimation and also with the authentication of link stability. Parameters such as energy, distance, and hop count are employed as willingness nodes, where both the energy and distance are entrenched through the OLSP. Consequently, the hop count is applied via the ACO system that is beneficial for link stability. After the acceptance of an acknowledgement, the hop count is authorized for further performance analysis. This approach increases the Quality of Service and also uses less energy compared to other energy models. The accomplished simulation upshot depicts that the ACO–EEOLSR outperforms the EEOLSR scheme with respect to the performance metrics of energy consumption, packet delivery ratio, total remaining time, average network lifetime, and a variance of energy.