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MOLSR: Mobile-agent based optimized Link State Routing Protocol

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Abstract

The popularity of Mobile Ad Hoc networks (MANETs) continues to increase due to the technological advances in wireless radios and wireless networks. Given the unpredictability of the wireless medium, one of the major challenges in MANETs remains to be the efficiency of the underlying routing protocol. The Optimized Link State Routing Protocol (OLSR) is one of the most popular routing protocols being deployed in MANETs. OLSR uses multipoint relay mechanism (MPR) to maintain the topology information at each node. Instead of using blind broadcasting where each node sends a control message to all its neighbors, and consequently every neighbor forwards the message to its neighbors, MPR selects a small set of nodes to do the broadcasting such that all network nodes are covered. In this paper, we propose improving further the performance of OLSR by introducing the concept of Mobile Agent (MA) when maintaining the MANET topology information, resulting in MA-based OLSR (MOLSR). In MOLSR, MA will substitute MPR and will rely on message unicast instead of broadcast, a major improvement to current OLSR in terms of traffic overhead. In MOLSR, every node creates and launches a MA that intelligently travels the network and returns with the full topology. In case of an MA loss, MOLSR automatically recovers the MA and makes sure it covers the whole network. Extensive simulation results show that MOLSR outperforms OLSR in various areas, namely the total control messages, network utilization, and reliable message transfer. © 2015 IEEE.

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