

An adaptive relay selection scheme for enhancing network stability in VANETs

ABSTRACT

Vehicular ad hoc networks (VANETs) are a special type of wireless ad hoc network that requires highly scalable routing strategies to establishing reliable end-to-end communication. Because of the high dynamic of VANETs, the mobility of vehicle nodes increases the control traffic overhead. Accordingly, establishing reliable end-to-end communication paths depends entirely on the routing mechanism and the type of nodes mobility information. In this paper, we propose a new improvement to the mechanism of the Optimized Link State Routing Protocol(OLSR) protocol, named Cluster-based Adept Cooperative Algorithm (CACA), where each vehicle estimate a reliable low-overhead path using the cluster-based QoS algorithm. The CACA algorithm is introduced to improve the ability of the MPR scheme for maintaining long-lived routes. Moreover, the network scalability is enhanced by adaptively selecting most sustainable paths based on a signal strength beacon and the mobility degree of a node, which reduces significantly minimizes the size of control messages overhead as well the routing tables recalculation process. Simulation experiments using the network simulator are presented to demonstrate the effectiveness of our solution. The results show that the proposed algorithm can improve network performance effectively relative to other algorithms.

Keyword: Quality of service; VANETs; Cooperative MPR scheme; Routing; Cluster-based; OLSR protocol