

Evaluating the impact of transmission range on the performance of VANET

ABSTRACT

Recently, interest in the field of Vehicular Ad-hoc Networks (VANETs) has grown among research community to improve traffic safety and efficiency on the roads. Despite the many advantages, the transmission range in vehicular network remains one of the major challenges due to the unique characteristics of VANETs such as various communication environments, highly dynamic topology, high node mobility and traffic density. The network would suffer from a broadcast-storm in high vehicular density when a fixed transmission range in VANET is used, while in sparse vehicular density the network could be disconnected frequently. In this paper, we evaluated the impact of different transmission ranges and number of flows formed between vehicles in a highway scenario using AODV as routing protocol. In order to validate the simulation of VANET, traffic and network simulators (SUMO & NS-2) have been used. The performance was evaluated in terms of packet delivery ratio and end-to-end delay. The simulation results have shown that better performance was achieved in term of higher PDR and lower end-to-end delay for less than 500 meters transmission range. On the contrary, the PDR started to decrease and end-to-end delay increased when the transmission range exceeded 500 meters. The performance degraded as the number of flows increased.

Keyword: End to end delay; Packet delivery ratio; Transmission range; VANET