Abstract

Development of routing protocols for Vehicular Ad hoc NETwork (VANET) is challenging due to rapid changes of the network topology in VANET. Nowadays, many efficient VANET routing protocols assume that present locations of destination nodes can be provided into their routing processes by location service. Unfortunately, relying on information from location service causes several limitations. Firstly, location service is only made available in some particular areas. Besides, it is necessary for nodes (cars) to install the ancillary equipment for identifying its present position (GPS) and informing the Position Information Service Center about its present position.

Due to the above limitations, the researcher proposed Greedy Routing Protocol for Inter-Vehicle Communication (GRP) which finds the suitable route for delivering data packets from a source node to a destination node by selecting the most suitable forwarding node (**P**) using the Set Covering and the Maximum Covering Location models. The number of neighboring nodes was used as the selecting criterion. This is different from other VANET routing protocols since GRP does not require the information about the present position of the destination node from any location service to forward data packets.

In addition, the researcher used the Network Simulator 2 (NS2) to study the dynamic characteristics of GRP and the performance of GRP compared to that of the Ad-hoc On-demand Distance Vector (AODV) protocol and the Contention-Based Forwarding (CBF) protocol. The Random Waypoint and the Manhattan Grid mobility models were used to control nodes' movements in both studies. The results of both studies were presented in this report as well.

The experimental results show that the three GRP parameters, i.e. the time for a source or forwarding node to wait for request reply packets (S_1), the time for neighboring nodes to wait for neighbor info reply packets (S_2), and the lifetime of the number of neighbor nodes information, affect the performance of GRP differently.

Moreover, the researcher found that GRP obtains about 25% higher packet delivery ratio compared to that of AODV. However, when compared to that of CBF, GRP has about 3.73% lower packet delivery ratio. The experimental results also indicate that as the number of selected forwarding nodes is increased, the packet delivery ratio will also be increased. Consequently, the performance of GRP and that of CBF gets closer.