protocols. This is expected because when the network becomes dense, the traffic rises and that can result in significant end-to-end delays.

Like in the case of the data traffic Load study, the DSR and GPSR are the most performers. AODV also has a minimum delay but only in scenario with low density. In the case of important density, its E2E increases, then, the performance of AODV decreases. As for the worst protocols, which are ZRP, followed by DSDV, DYMO and FSR take very long times to get the packet to its final destination compared to the others protocols. OLSR could be well classified as if it was not constrained, since it does not support dense networks. Finally, GPSR is the best choice for keeping end-to-end delay at a minimum level especially with the RDP that it has.

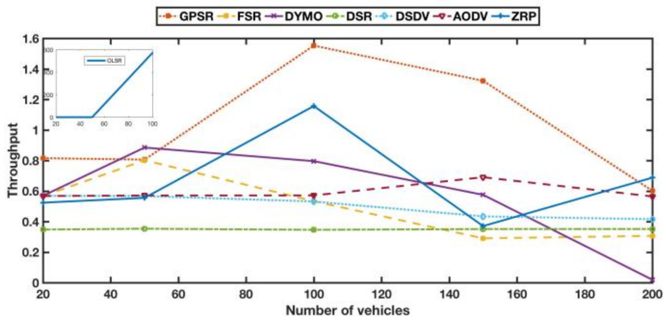

Figure 6: Throughput as function of density

Figure 6 presents the throughput as function of vehicle density. It shows that the GPSR has higher flow than the others protocols. the throughput of AODV and DSDV is almost stable in all case of density, while that of ZRP, DYMOUM and FSR varies unexpectedly. Further, DSR provides poor throughput where it addresses the most declined values compared to the other protocols.

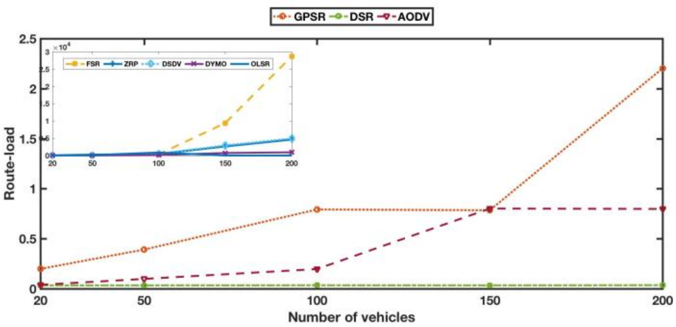

Figure 7: Routing Cost as function of density

Figure 7 illustrates the routing cost according to the number of moving vehicles. First of all, it is noted that when the number of mobile nodes increases, the cost increases especially for FSR, ZRP, DSDV, DYMO and OLSR. Moreover, by varying the number of nodes, GPSR, DSR and AODV protocols reduces the routing cost when compared with the five others. This reduction in the cost of routing can be explained by the fact that these protocols reduce the number of packets TC and does not increase the size of the message header HELLO. Therefore, no additional signaling overhead is induced.

CONCLUSION & PERSPECTIVES

This document describes the simulation model according to the number of nodes and the data traffic load in the network topology. It is appropriate to use the realistic scenario to appraise the scalability and the ability to support QoS of the above eight protocols for vehicular ad hoc network.

In our comparative study of the performance of eight widely acknowledged VANET routing protocols which are AODV, DSDV, DSR, FSR, OLSR, GPSR, ZRP and DYMO, we use a large-scale urban environment with realistic vehicle mobility under network traffic generated from VanetMobiSim. The four QoS metrics chosen are: packet delivery ratio, the throughput, the end to end delay and the routing cost.

This paper makes contributions in three areas. The first one illustrate literature surveying where we present a global overview of VANET, including routing protocols and their classification. The second area is the impact of urban scenarios on routing protocols, finally we put forward to use this large series of routing protocols for vehicular ad hoc networks.

Our goal is to provide a better understanding of these protocols and their behavior, and also provide a useful and beneficial reference for further study on different classes of vehicular routing protocols to support QoS.

According the result analysis, we can say that the geographic routing protocols perform better in Vehicular ad-hoc network compared to the other routing protocols since this type of protocols use the position information which is suitable for such a network.

So far we have seen in this study the different routing protocols and their own features and results. This comparison is essential to enhance existing protocols and design a new for VANET. This will be the object of our next research.

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