Effective Geographical Routing in the Presence of Unpredictable Node Mobility

Abstract

The geographical routing protocol employs position information from the localization system for multi-hop data communication. However, the location inaccuracy due to the unpredictable node mobility and the power consumption of localization system reduces the performance of geographical routing protocol. Several geographical routing protocols have been proposed in Mobile Ad Hoc Network (MANET). The well-known geographical routing among them is Greedy Perimeter Stateless Routing (GPSR). In GPSR, the dead end node selection for data communication easily handles the network scalability. However, the highly dynamic network topology makes frequent changes in the neighbor’s location. Hence, the inaccurate location information degrades GPSR performance. This paper proposed a Modified GPSR (MGPSR) protocol to improve the performance under a large scale and a high mobility network. Moreover, the MGPSR consists of Neighbor List Learning (NNL), Node Mobility Prediction (NMP), and Periodic Position Update (PPU) schemes to balance the data delay and packet delivery ratio. The NNL along with NMP scheme provides the accurate neighbor list under a high mobility network. Furthermore, the PPU supports the guarantee for accurate neighbor location. In addition, the proposed schemes reduce the usage of localization systems to...
provide accurate location information with low power consumption which improve the routing performance in MGPSR. This work simulates and compares the performance of an enhanced MGPSR in the aspects of packet delivery ratio and throughput with the existing GPSR. Thus, it proves the MGPSR outperforms the GPSR under a large scale with a high mobility network.

References

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