Content Distribution in Vehicular Networks using Coalitional Graph Game

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Abstract—The popular content distribution (PCD) problem in Vehicular Ad-hoc Networks (VANETs) is considered in this paper. We model this problem as a coalitional graph game in which the on-board units (OBUs) try to form a peer-to-peer (P2P) network where one OBU can transmit files to multi OBUs but receive from only one of the other OBUs each time, to complete the data dissemination efficiently. In this game, the OBUs engage in bilateral negotiations which result in a bilaterally agreement of forming a directed link among OBUs. Once the network is constructed, the OBUs will transmit the content pieces to each other. We study this game under a form of myopic dynamics which is carried out by each OBU in a distributed way. Furthermore, the network formed in this game is a pairwise stable network. Simulation results show that the proposed approach performs better comparing with the non-cooperative case.

Keyword—Vehicular Ad-hoc Networks, popular content distribution, coalitional graph game, myopic, pairwise stable

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