



Medium Access Control for Wireless Networks with Peer-to-Peer State Exchange

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Distributed medium access control (MAC) protocols are proposed for wireless networks assuming that one-hop peers can periodically exchange a small amount of state information. Each station maintains a state and makes state transitions and transmission decisions based on its state and recent state information collected from its one-hop peers. A station can adapt its packet length and the size of its state space to the amount of traffic in its neighborhood. It is shown that these protocols converge to a steady state, where stations take turns to transmit in each neighborhood without collision. In other words, an efficient time-division multiple access (TDMA) like schedule is formed in a distributed manner, as long as the topology of the network remains static or changes slowly with respect to the execution of the protocol.

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