Price-Based Resource Allocation Strategies for Wireless Ad Hoc Networks with Transmission Rate and Energy Constraints

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Abstract

Wireless ad hoc networks have attracted a lot of attention recently. Resource allocation in such networks needs to address both fairness and overall network performance. Pricing is a prospective direction to regulate behaviors of individual nodes while providing incentives for cooperation. In this work, we develop some pricing strategies for resource allocation by taking account of factors like multiple transmission rates and energy consumption of nodes, which have not been well studied in former works. We propose a clique-based model which allows us to achieve optimal resource utilization and fairness among network flows. We also sketch how our model can be extended to incorporate energy consumptions of flows. Simulation results are presented to show the effectiveness of these strategies.

Keyword：ad hoc network, nonlinear programming, pricing, resource allocation, wireless communication