Abstract

In mobile ad hoc networks, collision problem which is caused by the expansion of the interference range of the receiver node due to the controlled transmission power of the sender node is uniquely a tarnished problem. This paper employs physical and virtual carrier-sensing schemes to avoid the collision problem. We analyze the relationships among the transmission range, the carrier-sensing range, and the interference range in case power control is adopted, and based on the analysis; we propose a power aware range based MAC routing mechanism to prevent the collision problem from occurring in mobile ad hoc networks. This paper further analyzes the superiority of the proposed protocol under certain situations with the conventional DSR and AODV routing protocol. Also the proposed protocol analyzes the scalability factor by simulating with nodes ranging from 50 to 200 using NS2 network simulator. Extensive simulation results proved that the proposed PAR-Mac achieves better delivery ratio with reduced overhead and total energy consumption of nodes.


Index Terms

Computer Science

Wireless

Keywords

MAC Protocol  Scalable Mobile Ad hoc Networks  AODV  PAR-MAC