Abstract

Ad hoc networks offer infrastructure free operation, where no entity can provide reliable coordination among nodes. Medium Access Control (MAC) protocols in such a network must overcome the inherent unreliability of the network and provide high throughput and adequate fairness to the different flows of traffic. In this paper, we propose a MAC protocol that can achieve an excellent balance between throughput and fairness. Our protocol utilizes control-message handshake similar to IEEE 802.11. The protocol makes use of granule time slots and sequence of pseudo random numbers to maximize spatial reuse and divide the throughput fairly among nodes. We have demonstrated the performance of this protocol using simulation with fixed topologies. Our simulation results include a detailed comparison between the proposed protocol and existing protocol that has been shown to excel in terms of throughput or fairness.

Index Terms

Computer Science

Networks

Key words

Distributed multihop wireless networks

ad hoc networking

medium access control

random ranks

mini slots

aggregate throughput

long-term fairness