A Power Control MAC Protocol to Increase Spatial Reuse for IEEE 802.11 Ad-Hoc Wireless LANs

The paper proposed a distributed spatial reuse MAC protocol (named DSR) for IEEE 802.11 ad-hoc wireless LANs to increase bandwidth utilization and reduce power con-sumption. Through power control, the sender uses the right power to send to the receiver. In this way, the transmission range and the power consumption can be decreased while the spatial reuse can be increased. The communications that do not interfere to each other are allowed to be done simultaneously. Therefore, the overall efficiency and effectiveness of IEEE 802.11 ad-hoc wireless LANs can be enhanced. DSR could allow the maximum number of interference-free communication pairs to transmit in parallel and prevent them from collisions. According to the experiment results, DSR is much better than traditional wireless LAN protocol, IEEE 802.11 DCF, and the related work. The protocol indeed could effectively enhance the overall wireless LANs efficiency.