Abstract

In this paper we designed a modern Medium access control (MAC) protocol for wireless ad-hoc network that focuses on neighbor node information availability and uses directional antenna. MAC protocol coordinates different users to share the wireless channel fairly and resourcefully in the wireless networks. However, using directional antennas in ad-hoc networks causes new challenges such as new hidden terminal, deafness problems, unnecessary blocking of nodes etc. The problems arise mostly due to lack of information of the neighbor node's activities. Thus, we proposed a new directional MAC protocol name Adjacent Collaborative Directional MAC Protocol (ACDM) for wireless ad-hoc networks. The objective is to improve the throughput and delay performance together with overhead reduction of the wireless network. In addition, the integrity of the ACDM has been verified using the distributed network simulator tool NS-3. The simulation results have shown that the ACDM protocol outperforms the existing protocols of wireless networks using directional antennas by minimizing the depressing effect of hidden-terminal, deafness and head of line blocking problems that also avoids asymmetry-in-gain problem. The performance of ACDM protocol shows that it improves the throughput and reduces the overhead from the state-of-art works.
References


Optimization of Wireless Ad-hoc Networks using an Adjacent Collaborative Directional MAC (ACDM) Protocol


Index Terms

Computer Science Networks

Keywords

ACDM Directional Antenna Medium Access Control Ad-hoc Network IEEE802. NAV

neighbor accommodating MAC

Collaborative MAC

Directional MAC.