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## Abstract

In wireless ad-hoc networks, the beam forming antenna technology is a new and promising solution to many challenges. Beam forming antennas have the ability to increase the spatial reuse, improve the transmission reliability, extend the transmission range and/or save the power consumption. If they are effectively used, they can significantly improve the network capacity, lifetime, connectivity and security. However, traditional Medium Access Control (MAC) protocols fail to exploit the potential benefits due to the unique characteristics of wireless ad-hoc networks with beam forming antennas. Ad-hoc networks suffer from the problem of hidden nodes (terminals), which leads to several degradation of network throughput. This survey gives a comprehensive overview of Medium Access Control (MAC) protocols which directly or indirectly address this problem. Open research discussions are also discussed to serve as a starting point for future protocol design and evaluation.

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## Index Terms

Computer Science Networks

## Keywords

Beam forming antennas MAC protocol Wireless ad-hoc network.