TCP throughput optimization over 802.11 MAC protocol in multi-hop ad-hoc networks.

ABSTRACT

The acknowledgment strategy has great potential to increase the TCP throughput when it runs over 802.11 MAC protocol. In particular TCP acknowledgments carry out an extensive number of medium accesses as they compete in the same route as data packets for media. As the load increases, the well-known hidden terminal effects caused by interference between ACK and data packets in MAC layer can degrade TCP performance dramatically if TCP acknowledges every incoming data packets. In this paper, we propose a TCP-MAC interaction strategy which tries to reduce the number of induced ACKs by monitoring the channel condition. To this end, the total collision probability collected along the path in MAC layer is used to properly set the number of the delayed ACKs in TCP. Based on the measured collision probability, TCP sender dynamically adjusts itself to the channel condition by delaying less ACKs in high traffics and more in low traffic conditions. The simulation results show a reasonable tradeoff between performance under moderate and high traffics.