

Abstract

The IEEE 802.11 distributed coordination function (DCF), the primary technique of Medium Access Control (MAC), is the most widely used standard in the wireless network. DCF is a carrier sense multiple-access with collision avoidance (CSMA/CA) scheme with binary-slotted exponential backoff. The performance of the DCF relies on the binary backoff procedure (BEB) to a considerable extent in terms of delay, throughput and packet drop probability. In this dissertation, we started with a background study of Wireless LAN, IEEE 802.11 DCF and the models proposed by Bianchi and Xiao to gain the required information about the standard backoff procedure used in DCF. The foundation element of our proposed procedure is the backoff procedure proposed in the Bianchi's model. In the proposed backoff procedure, the backoff counter is determined within a range that is less than that of the Bianchi's model which results in a reduction of the collision of packets thereby increasing the throughput, and reducing the delay and packet drop probability. Numerical analysis and simulation studies are done to reveal the performance gain in comparison with standard backoff procedure.