

# Abstract

## Enhancement of IEEE 802.11 PCF scheduling and IEEE 802.11e EDCA

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As the growth of various multimedia applications, quality of service (QoS) has become an important issue. Lacking of link stability, QoS in wireless environment has more challenge compared with that in wired network. This thesis provides two enhanced approaches based on the most widely deployed wireless LAN technology, IEEE 802.11, and its amendment, 802.11e.

In the first part of this thesis, we propose a solution which aims to improve the performance of Point Coordination Function (PCF) in 802.11. PCF is designed as a centralized scheme and is suitable for delay-sensitive or bandwidth-demand traffic. However, the standard only recommends Round Robin as the scheduling mechanism. The scheduling scheme has critical influence on the final performance of PCF. The simulation results have shown that the proposed method outperforms Round Robin both in delay and throughput.

The second part of the thesis targets at the IEEE 802.11e Enhanced Distributed Channel Access (EDCA), which is the QoS complement to the original 802.11 standard. Contrary to PCF, EDCA is defined as a distributed medium access scheme. Contrary to PCF, EDCA is

defined as a distributed medium access scheme. By only introducing two parameters, the proposed scheme could significantly reduce the total energy consumption compared with the original EDCA. Besides, the numerical results show that the proposed method could reduce the average packet delay as well.

The solutions proposed in this thesis are fully complied with IEEE 802.11 and 802.11e. By extensive simulation, they have been shown to be both efficient and practical.

