

Providing dynamic TXOP for QoS support of video transmission in IEEE 802.11e WLANs

ABSTRACT

The IEEE 802.11e standard introduced by IEEE 802.11 Task Group E (TGe) enhances the Quality of Service (QoS) by means of HCF Controlled Channel Access (HCCA). The scheduler of HCCA allocates Transmission Opportunities (TXOPs) to QoS-enabled Station (QSTA) based on their TS Specifications (TSPECs) negotiated at the traffic setup time so that it is only efficient for Constant Bit Rate (CBR) applications. However, Variable Bit Rate (VBR) traffics are not efficiently supported as they exhibit nondeterministic profile during the time. In this paper, we present a dynamic TXOP assignment Scheduling Algorithm for supporting the video traffics transmission over IEEE 802.11e wireless networks. This algorithm uses a piggybacked information about the size of the subsequent video frames of the uplink traffic to assist the Hybrid Coordinator accurately assign the TXOP according to the fast changes in the VBR profile. The proposed scheduling algorithm has been evaluated using simulation with different variability level video streams. The simulation results show that the proposed algorithm reduces the delay experienced by VBR traffic streams comparable to HCCA scheduler due to the accurate assignment of the TXOP which preserve the channel time for transmission.

Keyword: Quality of Service (QoS); 802.11e; Medium Access Control (MAC); HCCA; TXOP