Impact of traffic priorities and channel load on the DCC Mechanism of the IEEE802.11p

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Abstract:

IEEE802.11p MAC (Medium Access Control) protocol has drawbacks when it comes to scheduling safety- related data. An enhancement has been proposed by the European Telecommunications Standards Institute (ET SI), the Decentralized Congestion Control (DCC) mechanism. Implemented on top of the MAC Layer, it leads to improve the priority channel access under high load scenarios. This paper studies two issues. On one hand, Cooperative Awareness Messages (CAMs) and Decentralized Environmental Notification Messages (DENMs) will have different priority profiles, and initially all safety-related data traffic will be scheduled with the same DCC mechanism. This contribution analyzes the impact of different traffic priorities on the DCC mechanism performance. On the other hand, the impact of different channel loads on the DCC Mechanism. Results are given as cumulative density function (CDF) of the MAC-to-MAC delay for no DCC, currently proposed DCC and our DCC proposal.