IEEE P802.11
Wireless LANs

|  |
| --- |
| Channel Access - High Priority EDCAs |
| Date: 2024-11-14 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Dmitry Akhmetov |  |  |  |  |
| Kiseon Ryu |  |  |  |  |
| Peshal Nayak |  |  |  |  |
| Mingyu Lee |  |  |  |  |
| Yue Qi |  |  |  |  |
| Yonggang Fang |  |  |  |  |
| Alfred Asterjadhi |  |  |  |  |

Abstract

This document contains detailed text proposal for High Priority EDCA.

The authors prepared this document to further clarify our proposals related to Channel Access – High Priority EDCA in text format. The authors look forward to working with all interested participants to prepare an official proposal for specification text on Channel Access – High Priority EDCA.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: editorial changes, changes to align text with SP2 bullets, feature name changed.

The texts is prepared for the following motions and straw polls.

SP1

[Motion 123, doc #11-24/0171r19 ,SP2 – Channel Access, doc 11-24/1667r13]

**Do you agree to improve EDCA to reduce tail access delay of Low Latency traffic in multi-BSS dense scenarios in presence of best effort traffic?**

* The solution to improve EDCA is distributed
* The impact on legacy device has to be balanced
* Low Latency traffic is treated as AC\_VO traffic. Other cases are TBD

SP2:, doc 11-24/1144r1

[Motion XXX, #SPYYY]

**Do you agree to define PEDCA in UHR where a STA with Low Latency traffic may be allowed, based on TBD conditions, to send a Defer Signal (e.g. CTS frame or RTS) to start a protected short contention for pending LL data**

* Conditions to be allowed to send a Defer Signal is TBD
* STA in PEDCA always use RTS/CTS as initial frame exchange and retry.
* Duration of protected short contention is TBD.
* Access parameters (AIFSN, CW and the expansion rules) used to transmit the Defer Signal are TBD.
* The retry count where the Defer Signal is allowed to be sent is TBD
* Contention parameters for the protected short contention are TBD. The STAs that transmitted a Defer Signal but did not win the protected short contention will initiate a new retry.
* Low Latency traffic is treated as AC\_VO traffic. Other cases are TBD.
* The solution would provide control on the degree of collisions that may occur while using it and, allows for autonomous randomness or/and controlled by the AP
* No new synchronization requirement on STA side

**Prioritized EDCA**

Prioritized EDCA (PEDCA) is an extension of the baseline EDCA procedure that aims at improving the tail latency for traffic buffered to the transmit queue for AC\_VO. Other cases are TBD. The PEDCA procedure allows STA to transmit a TBD control frame to initiate a PEDCA contention period. A PEDCA contention period is designated for those STAs that transmitted the TBD control frame. The PEDCA mechanism should balance the impact on devices that are using baseline EDCA mechanism.

A STA with low latency traffic buffered into the transmit queue of AC\_VO and that has dot11HIPEDCAOptionImplemented set to 1 may become PEDCA eligible STA based on TBD conditions. A PEDCA eligible STA shall transmit a TBD control frame to initiate a PEDCA contention period. The TBD control frame shall be scheduled for transmission at the end of TBD PEDCA slot boundary of idle medium (i.e., the medium is detected to be IDLE using both PHY and virtual CS mechanisms).

Multiple PEDCA eligible STAs may transmit the TBD control frame at about the same time.

NOTE—There is no new synchronization requirements for the PEDCA eligible STAs that transmit the TBD control frame.

The PEDCA contention period starts following the end of transmission of the TBD control frame and shall follow the random backoff procedure defined in 10.23.2.4 (Obtaining an EDCA TXOP) with the following requirements:

* Only EDCAF[VO] allowed for contention during PEDCA contention period,
* The value of PEDCA AIFSN[VO] is TBD,
* at the start of a PEDCA contention period, a PEDCA eligible STA shall set the PEDCA backoff counter to an integer value chosen randomly with a uniform distribution taking values in the range 0 to PEDCA CW[VO]. The value of PEDCA CW[VO] is TBD,

The TBD control frame is of non-HT PPDU format and TBD data rate and TBD MAC content.

A PEDCA eligible STA that successfully obtained a TXOP using PEDCA contention shall not use PEDCA mechanism until TBD conditions are satisfied.

A PEDCA eligible STA that did not obtain a TXOP using PEDCA contention may attempt to transmit the TBD control frame, to initiate another PEDCA contention, for up to TBD retries.

 The STA shall increment its PEDCA retry count by unit every time the STA did not obtain a TXOP using PEDCA contention. If the STA does not obtain a TXOP using the PEDCA contention for TBD retries then the STA shall not attempt to initiate another PEDCA contention until TBD conditions are satisfied. The STA reset its PEDCA retry count to 0 when these TBD conditions are satisfied or when the STA successfully obtains a TXOP using PEDCA contention.

 A PEDCA eligible STA, that obtains a TXOP during short protected PEDCA contention period, shall initiate the frame exchange with an RTS/CTS exchange.

The RTS(s) frame are of non-HT PPDU format and TBD data rate.