oIEEE P802.11
Wireless LANs

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| PDT MAC High Priority EDCAs |
| Date: 2024-12-01 |
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Abstract

This document contains Proposed Draft Text (PDT) for the Channel Access – High Priority EDCA feature of the proposed TGbn (UHR, Ultra High Reliability) amendment to the 802.11 standard.

This version of PDT includes the motions passed in IEEE up to November 2024.

# Revision information

The following is a summary of the important changes that occurred within each revision of this document:

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| **Revision** | **Major changes** |
| 0 | Initial revision: motion passed in IEEE November 2024 |
| 1 | Editorial:* Updated authors list
* From multiple individuals: marked last sentence as “Editor’s note”. “Balance the impact mean “that improvements should not come at the expense of legacy devices and if there is an impact – the feature should have reasonable handles to control it. More details will follow once we pass more SPs/motions and that sentence will naturally be gone
* from Alfred – “mechanism” -> channel access protocol”
* Xiaofei Wang – changed tail access delay to worst case access latency; deleted “Details TBD”; “aims at reducing” -. “reduces”
* From Mark Rison: “low latency traffic buffered…” -> low latency AC\_VO traffic
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| 2 | Editorials:* From multiple individuals: Added “TBD rules” to “balance the impact” sentence and removed Editor’s note; removed “expected” and replaced with “should” as not this sentence has “TBD rules”
* Yongho Seok: reverted worst -case to tail access delay latency;
* From Mark Rison: reverted “protocol “ to “mechanism”
* From Minyoung: Moved other cases are TBD into parenthesis to explicitly connect to AC\_VO traffic
* Added SP text
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| 3 | Editorials:* From multiple individuals: modified “tail access delay” to “the access delay distribution tail”
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| 4 | Technical: * Merged and approved all previously received comments as motioned in Motion 211[2]
* Added SP2/Motion 272 text approved in Jan IEEE meeting
* Added text corresponding to Motion 272
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# Introduction

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbn Draft. The abstract, revision information, introduction, explanation of the proposed changes and references sections are not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbn Draft (i.e., they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

## Explanation of the proposed changes:

The proposed changes to the 802.11 TGbn draft within this document are based on the following motions adopted by the TGbn task group:

### Relevant passed motions:

[Motion 123, [1] 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

[Motion 272, [2] doc #11-25-0014r7, SP – Channel Access: doc 11-24/2074r18

**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 (it is TBD whether RTS or CTS frame is used) 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 mandatory synchronization requirement on STA side
* HIP EDCA is used by the STA in a BSS only when this feature is enabled by the AP

# Text to be adopted begins here:

***TGbn editor: please make changes to the following subclause:***

37.2 Prioritized EDCA[#M123]

Prioritized EDCA (P-EDCA) is an enhancement of the EDCA mechanism (see 10.23.2 (HCF contention based channel access (EDCA)) that reduces the access delay distribution tail for low latency AC\_VO traffic (other cases are TBD). The use of P-EDCA by a UHR STA should balance the impact on STAs that do not use P-EDCA with TBD rules.

A STA with low latency traffic buffered into the transmit queue of AC\_VO and that has dot11PEDCAOptionImplemented set to 1 and with dot11PEDCAActivated set to 1 is called P-EDCA eligible STA. A P-EDCA eligible STA may start a P-EDCA protected short contention period (or P-EDCA contention) to deliver buffered traffic. The exact mechanism to update dot11PEDCAActivated is TBD.

The protected duration of P-EDCA contention is TBD

To start P-EDCA contention the P-EDCA eligible STA shall a) satisfy TBD conditions and b) transmit a TBD control frame. The P-EDCA eligible STA transmits the TBD control frame at the TBD slot boundary if STA’s CS mechanism (see 10.3.2.1 (CS mechanism)) determines that the medium is idle.

The TBD control frame shall be transmitted in a non-HT PPDU format and TBD data rate. The value of address field is TBD; the value of Duration field is set with respect to the duration of protected short period.

The P-EDCA contention start 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 P-EDCA contention
* The value of PEDCA AIFSN[VO] is TBD,
* at the start of a P-EDCA contention, a STA shall set the P-EDCA backoff counter to an integer value chosen randomly with a uniform distribution taking values in the range 0 to P-EDCA CW[VO]. The value of P-EDCA CW[VO] is TBD

A P-EDCA eligible STA, that obtained a TXOP during P-EDCA contention, shall transmit an RTS as initial frame in the TXOP.

A P-EDCA eligible STA that successfully (as in 10.23.2.2 EDCA Backoff procedure) delivered pending MPDUs in a TXOP obtained using P-EDCA contention shall not use P-EDCA mechanism until TBD conditions are satisfied.

A P-EDCA eligible STA that did not obtain a TXOP using P-EDCA contention or failed to receive CTS frame to an RTS frame transmitted in the TXOP obtained using P-EDCA contention may start another P-EDCA contention, for up to TBD retries consecutively.

# Text to be adopted ends here.

**References:**

1. [11-24-0171r21](https://mentor.ieee.org/802.11/dcn/24/11-24-0171-21-00bn-tgbn-motions-list-part-1.pptx): 11-24-0171-21-00bn-tgbn-motions-list-part-1, Alfred Asterjadhi (Qualcomm Inc.)
2. [11-25-0014-r7](https://mentor.ieee.org/802.11/dcn/25/11-25-0014-07-00bn-tgbn-motions-list-part-2.pptx): 11-25-0014-07-00bn-tgbn-motions-list-part-2, Alfred Asterjadhi (Qualcomm Inc.)