IEEE P802.11
Wireless LANs

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| LB266 - Resolution for CID 10924 |
| Date: January 16th, 2023 |
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 Abstract

This submission proposes a resolution for following CID received of LB266 (TGbe D2.0): 10924

***TGbe editor: The baseline for this document is TGbe D2.3***

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Revised wording about enabled TIDs in R-TWT.
* Rev 2: Included comments received during initial presentation to TGbe MAC ad-hoc

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| **CID** | **Commenter** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 10924 | Thomas Handte | 35.3.22 | 478 | 19 | In some cases triggered channel access creates more overhead than distributed channel access (e.g. small data frames to be transmitted). Currently the multi link SCS procedure has no EDCA but only triggered access variant. | Suggest to add an EDCA alternative by the EHT AP to enable transmission of uplink data frames: For example: The transmission of uplink data frames should alternatively be enabled by the EHT AP allocating a TWT or R-TWT SP to the respective EHT STA if supported by both EHT STAs. In this case, the TWT or R-TWT SP should not be trigger-enabled, and the members STAs should not await a trigger frame before accessing the channel once the SP begins. | **Revised**Agree with the commenter in principle.**TGbe editor, please implement changes as shown in red in doc 11-22/1935r2** |

**Discussion**

The EHT SCS procedure can be used by a non-AP EHT STA to request an EHT AP to classify incoming individually addressed MSDUs based on parameters provided by the non-AP STA via QoS Characteristics element. The QoS Characteristics element is a reference for the EHT AP’s scheduling.

As of now, the EHT AP may enable transmission of uplink Data frames by trigger frame only. However, the use of trigger frame comes with overhead:
Basic Trigger frame and response to indicate awake state, Basic Trigger frame to initiate uplink data transfer, (see Fig. 26-10 of 802.11ax-2021).

This overhead is too high compared to EDCA particularly when only small data frames are to be transmitted by a non-AP EHT STA or number of non-AP EHT STAs is low e.g., just one.

Therefore, the suggestion is to add an alternative in which the EHT AP can enable uplink traffic such that non-AP EHT STAs can use EDCA:

An EHT AP can enable uplink traffic by using a negotiated TWT or R-TWT service period (SP) of which the respective non-AP EHT STA is a member. Such an SP is non-trigger-enabled, and the non-AP EHT STA should access the channel by EDCA during the SP. If a SP is trigger enabled, a non-AP EHT STA should await a trigger frame before transmitting (as in baseline specification).

**35.17 EHT SCS procedure
*TGbe editor: Please update the following paragraph in this subclause as shown below:***The QoS Characteristics element is a reference for the EHT AP’s scheduling. An EHT AP should schedule transmission of downlink frames such that the delay bound and minimum data rate requested are met for the downlink Data frames if the Direction subfield of the QoS Characteristics element indicates downlink. An EHT AP should enable the transmission of uplink frames from the EHT STA with an interval that falls between the requested minimum and maximum service intervals and the AP should meet the minimum data rate requested if the Direction subfield of the QoS Characteristics element indicates uplink. An EHT AP should enable the transmission of direct link frames from the EHT STA to another STA on the link specified in the LinkID subfield of the Control Info field with an interval that falls between the requested minimum and maximum service intervals.

The transmission of uplink Data frames should be enabled

* by using Basic Trigger frames, or
* alternatively by using MU-RTS TXS Trigger frames if both EHT STAs have dot11EHTTXOPSharingTFOptionImplemented equal to true, or
* alternatively by using a non-trigger-enabled R-TWT SP if the EHT STA is an R-TWT scheduled STA and a non-trigger-enabled R-TWT SP was negotiated, or
* alternatively by using a non-trigger-enabled TWT SP if the EHT STA is an TWT scheduled STA and a non-trigger-enabled TWT SP was negotiated.

The transmission of direct link frames should be enabled by using MU-RTS TXS Trigger frames if both EHT STAs have set the Triggered TXOP Sharing Mode 2 Support field in their transmitted EHT Capabilities elements to 1.

If the EHT STA is a TWT scheduled STA or TWT requesting STA (see 26.8 (TWT operation)) and there are negotiated TWT SPs for the TID specified in the QoS Characteristics element with the EHT AP, the EHT AP should ensure that the service interval aligns with negotiated TWT wake intervals.

If the EHT STA is an R-TWT scheduled STA (see 35.8 (Restricted TWT (R-TWT))) and there are negotiated R-TWT SPs for the TID specified in the QoS Characteristics element then the EHT AP should use these R-TWT SPs to serve traffic corresponding to the TID and specified direction in the QoS Characteristics element. If negotiated R-TWT SPs for the TID specified in the QoS Characteristics element are trigger-enabled R-TWT, then the EHT AP should ensure that the trigger frames are scheduled at the start of the R-TWT SPs. If negotiated R-TWT SPs for the TID specified in the QoS Characteristics element or negotiated TWT SPs are non-trigger-enabled, then the non-AP EHT STA which is a member of the SP should contend for channel access within the SP for the transmission of uplink data frames if any.

The EHT AP may discard a downlink data frame if the lifetime of the frame has exceeded the value specified by the MSDU Lifetime field.

NOTE 2—A QoS Characteristics element provided by a non-AP EHT STA is used by a receiving EHT AP to facilitate the creation of a schedule for contention based channel access (EDCA) or MU operation. How the AP uses the information provided by the non-AP STA QoS Characteristics element that do not have corresponding normative requirements is beyond the scope of the standard.