IEEE P802.11
Wireless LANs

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| 11ax D6.0 comment resolution 9.7.3 |
| Date: 2020-03-28 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D6.0 with the following CIDs:

* 24004, 24085, 24086, 24087, 24088, 24468, 24509, 24510.

Revisions:

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 TGax Draft. This introduction is not part of the adopted material.

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

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | **Resolution** |
| 24004 | 245 | 30 | The MU-BAR variant of Trigger frames should be listed as a possible Trigger MPDU | Replace "One or more Basic Trigger" with "A MU-BAR Trigger frame, or one or more Basic Trigger" | **Rejected****Discussion:** **802.11 baseline specification doesn’t allow BAR to be aggregated in an A-MPDU with QoS Data frames. 802.11 ax follows the same restriction: MU-BAR that is the combination of BAR and trigger will not be aggregated in A-MPDU with QoS Data frames.****When the QoS Data frames want the acknowlwdgement, the Ack Policy HTP Ack or Implicit BAR can be used. With HTP Ack, MU-BAR is not neded to be aggregated with the QoS Data frames in an A-MPDU.** |
| 24085 | 237 | 26 | For the Trigger frame in Table 9-531, it says "The Trigger frames are the first MPDUs of the A-MPDU unless the A-MPDU also carries an Ack or BlockAck frame in which case the Trigger frames are included immediately after the Ack or BlockAck frame." This means, when multiple Trigger frames are present in the A-MPDU, all of them has to be located first or just after Ack/BlockAck if that is present. The intent should be, at least one Trigger frame is located first or just after Ack/BlockAck. | Change it to read "At least one Trigger frame is the first MPDU of the A-MPDU unless the A-MPDU also carries an Ack or BlockAck frame in which case the Trigger frame is included immediately after the Ack or BlockAck frame." | RejectedDiscussion: There is a reason to require all Trigger frames to be the first in the A-MPDU: it simplifies the receiver design. If it is known that a Trigger frame will always be received before a frame requiring acknowledgment, then the receiver design is simplified in the sense that it has two possible response paths. If, at the time the receiver comes across an frame requiring acknowledgement it will either already have received a Trigger frame, in which case the response is format is an HE TB PPDU or it will not have received a Trigger frame and the response format is known to be an SU PPDU (or no response at all if the ack policy is HTP Ack). Allowing Trigger frames to appear anywhere in the A-MPDU would complicate the receiver design: the receiver would not know the response PPDU format (and timing) or whether to respond at all until the last frame of the A-MPDU had been processed. |
| 24086 | 237 | 33 | Other tables including a Trigger frame allow to have multiple copies of the Trigger frame. There is no reason to restrict it for Table 9-531. So does the condition to allow aggregating BSRP and BQRP Trigger frames apply for this. | Copy NOTE 2 and NOTE 3 from Table 9-532a and paste them in Table 9-531 as NOTE 1 and NOTE 2 (renumber). Add "See NOTE 1 and NOTE 2." at the end of the Conditions column of the Trigger frame. | RevisedAgree with the commenter. In addition, BQRP Trigger is addedTGax editor to make changes in 11-20/549r3 under CID 24086 |
| 24087 | 241 | 44 | For the Trigger frame In Table 9-532b, it says "The Trigger frames are the first MPDUs of the A-MPDU unless the A-MPDU also carries an Ack or BlockAck frame in which case the Trigger frames are included immediately after the Ack or BlockAck frame." This means, when multiple Trigger frames are present in the A-MPDU, all of them has to be located first or just after Ack/BlockAck if that is present. The intent should be, at least one Trigger frame is located first or just after Ack/BlockAck. | Change it to read "At least one Trigger frame is the first MPDU of the A-MPDU unless the A-MPDU also carries an Ack or BlockAck frame in which case the Trigger frame is included immediately after the Ack or BlockAck frame." | RejectedDiscussion: There is a reason to require all Trigger frames to be the first in the A-MPDU: it simplifies the receiver design. If it is known that a Trigger frame will always be received before a frame requiring acknowledgment, then the receiver design is simplified in the sense that it has two possible response paths. If, at the time the receiver comes across an frame requiring acknowledgement it will either already have received a Trigger frame, in which case the response is format is an HE TB PPDU or it will not have received a Trigger frame and the response format is known to be an SU PPDU (or no response at all if the ack policy is HTP Ack). Allowing Trigger frames to appear anywhere in the A-MPDU would complicate the receiver design: the receiver would not know the response PPDU format (and timing) or whether to respond at all until the last frame of the A-MPDU had been processed. |
| 24088 | 241 | 51 | NOTE 1 should be also referred to.Also, the expression of NOTE 1 in Table 9-532b is a little bit different from that of NOTE 2 in Table 9-532a. The expression in Table 9-532a is more cautious. There is no reason having different expressions. | Change "See NOTE 2." to "See NOTE 1 and NOTE 2."Copy the content of NOTE 2 in Table 9-532a and overwrite the content of NOTE 1 in Table 9-532b. | Accepted |
| 24468 |  |  | There is no reason to require all Trigger frames to be first in the A-MPDU (after any immediate ack). The point of having multiple Trigger frames is to mitigate corruption, but having them all bunched up means they are more vulnerable to periodic interference. The AP should be allowed to decide where best to place multiple Trigger frames, if it decides to include them. The resolution to CID 22276 claims that this "can gave the destinated STAs more time to prepare the HE TB PPDU" but this is bogus because (a) all but the last Trigger frame might be corrupted (not received) and so (b) the way a STA ensures it has enough time to prepare is to specify its needs in the Trigger Frame MAC Padding Duration subfield of the HE MAC Capabilities Information field | Delete "The Trigger frames are the first MPDUs of the A-MPDU unless the A-MPDU alsocarries an Ack or BlockAck frame in which case the Trigger frames are includedimmediately after the Ack or BlockAck frame." in the tables in the referenced subclause | RejectedDiscussion: There is a reason to require all Trigger frames to be the first in the A-MPDU: it simplifies the receiver design. If it is known that a Trigger frame will always be received before a frame requiring acknowledgment, then the receiver design is simplified in the sense that it has two possible response paths. If, at the time the receiver comes across an frame requiring acknowledgement it will either already have received a Trigger frame, in which case the response is format is an HE TB PPDU or it will not have received a Trigger frame and the response format is known to be an SU PPDU (or no response at all if the ack policy is HTP Ack). Allowing Trigger frames to appear anywhere in the A-MPDU would complicate the receiver design: the receiver would not know the response PPDU format (and timing) or whether to respond at all until the last frame of the A-MPDU had been processed. |
| 24509 | 233 | 42 | "All of the MPDUs within an A-MPDU have the same TA." -- either this duplicates existing requirements (which is what the resolution to CID 22394 seems to be saying), in which case it is not needed, or it cannot be imposed on legacy STAs, in which case it needs to be restricted to HE STAs | Delete the cited text | RejectedDiscussion: In 802.11 baseline, a single STA/AP transmit frames in a PPDU. This rule is implicit. In 802.11ax, multiple APs defined by Multiple BSSID feature can transmit frames in a DL HE MU PPDU. Further the broadcast frame in a specific broadcast RU can addressd to STAs associated with different APs. As an example the following is defined in 11ax D6.0: For each BSS belonging to the multiple BSSID set for which the AP has received an HE TB PPDU, the AP responds with a Multi-STA BlockAck frame with RA field set to the broadcast address and carried in a DL HE MU PPDU. With these observation, TGax group decides to add the text “All of the MPDUs within an A-MPDU have the same TA”. |
| 24510 | 233 | 42 | "All of the MPDUs within an A-MPDU have the same TA." -- either this duplicates existing requirements (which is what the resolution to CID 22394 seems to be saying), in which case it is not needed, or it cannot be imposed on legacy STAs, in which case it needs to be restricted to HE STAs | Change "All of the MPDUs within an A-MPDU have the same TA." to "All of the MPDUs within an A-MPDU sent by an HE STA to another HE STA have the same TA." | RejectedDiscussion: In 802.11 baseline, a single STA/AP transmit frames in a PPDU. This rule is implicit. In 802.11ax, multiple APs defined by Multiple BSSID feature can transmit frames in a DL HE MU PPDU. Further the broadcast frame in a specific broadcast RU (RU being identified by 2047) can addressd to STAs associated with different APs. As an example the following is defined in 11ax D6.0: For each BSS belonging to the multiple BSSID set for which the AP has received an HE TB PPDU, the AP responds with a Multi-STA BlockAck frame with RA field set to the broadcast address and carried in a DL HE MU PPDU. With these observation, TGax group decides to add the text “All of the MPDUs within an A-MPDU have the same TA”. |

**9.7.3 A-MPDU contents**

***TGax editor: Change Table 9-531 as follows: (#24086)***

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| * A-MPDU contents in the data enabled no immediate response context
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| MPDU Description | Conditions |
| Delayed BlockAcks | For a non-HE STA: BlockAck frames for a TID for which an HT-delayed block ack agreement exists with the BA Ack Policy subfield equal to No Acknowledgment. |
| Delayed Block Ack data | For a non-HE STA: QoS Data frames with a TID that corresponds to an HT-delayed block ack agreement.These have the Block Ack ack policy. |
| Data without a block ack agreement | QoS Data frames with a TID that does not correspond to a block ack agreement.These have No Ack ack policy and the A‑MSDU Present subfield equal to 0. |
| Action No Ack | Action No Ack frames. |
| HT-delayed BlockAckReqs | For a non-HE STA: BlockAckReq frames with the BAR Ack Policy subfield equal to No Acknowledgment and with a TID that corresponds to an HT-delayed block ack agreement. |
| Trigger | For an HE AP: Trigger frames where the Trigger Type field is Basic Trigger frame , BSRP Trigger frame, or BQRP Trigger frame.The Trigger frames are the first MPDUs of the A-MPDU unless the A-MPDU also carries an Ack or BlockAck frame in which case the Trigger frames are included immediately after the Ack or BlockAck frame.See NOTE 1 and NOTE 2. |
| QoS Null frame with No Ack ack policy | For an HE STA: QoS Null frames with No Ack ack policy. |
| NOTE 1—Only an HE AP is allowed to include a Trigger frame in the A-MPDU. The presence of more than one copy of a Trigger frame in an A-MPDU might increase the probability of the successful reception of the Trigger frame. The content of all Trigger frames in the A-MPDU is the same.NOTE 2–The BSRP and BQRP Trigger frames can be aggregated with other MPDUs in the A-MPDU if the receiver has indicated the support of receiving these trigger types in the BSRP BQRP A-MPDU Aggregation field of the HE Capabilities element. |