IEEE P802.11
Wireless LANs

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| 11ax D4.0 Comment Resolution 26.6.4.2 26.6.4.4 |
| Date: 2019-06-19 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D4.0 with the following CIDs:

* 20428, 20825, 20826, 20196, 20330, 20393, 20394, 20427, 21066, 21067,
* 21137, 21607

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** |
| 20428 | 355 | 14 | Clarification. This subclause is for ack-enabled single TID A-MPDU opeartion, which is different from multi-TID opeation covered in 26.6.4.4. In general, it is confusing to have the term "ack-enabled multi-TID A-MPDU" but an ack-enabled A-MPDU is explicitly a disjoint set of things (because the latter must be single-TID). Rename "ack-enabled A-MPDU" as "ack-enabled single-TID A-MPDU" throughout the Standard. | Insert in subclause title: "Ack-enabled \_single-TID\_ A-MPDU operation" Similarly, insert "single-TID" in all sentences in the Standard that state "ack-enabled A-MPDU". | RevisedDiscussion: since the ack-enabled A-MPDU includes single QoS Data frame that solicits Ack or single Management frame that solicits Ack. Calling it ack-enabled single-TID A-MPDU is not good. In the comment resolution of CID 20133 of 9.7.3, ack-enabled single-TID A-MPDU is renamed to ack-enabled A-MPDU. TGax editor to make change in 11-19/1035r0 under CID 20428  |
| 20825 | 355 | 17 | "Table 9-532b (A-MPDU contents in theHE ack-enabled single TID immediate response context)" is not a hyperlink so will rot | As it says in the comment | RevisedDiscussion: since the ack-enabled A-MPDU includes single QoS Data frame that solicits Ack or single Management frame that solicits Ack. Calling it ack-enabled single-TID A-MPDU is not good. In the comment resolution of CID 20133 of 9.7.3, ack-enabled single-TID A-MPDU is renamed to ack-enabled A-MPDU. TGax editor to make change in 11-19/1035r0 under CID 20825 |
| 20826 | 355 | 20 | "NOTE---An ack-enabled A-MPDU does not contain more than one of the following frames: QoS Data frames, Manage-ment frame that solicits acknowledgment." -- not clear because "QoS Data frame" can refer to b4-v7 of FC, or just b4 | Change to "NOTE---An ack-enabled A-MPDU does not contain more than one of the following frames: Data frame of subtype QoS Data (whether or not it solicits acknowledgment), Management frame that solicits acknowledgment." | RejectedDiscussion: QoS Data frames are used in 802.11 baseline to describe the content of A-MPDU.  |

**26.6.4.2 Ack-enabled A-MPDU operation**

***TGax editor: change 26.6.4.2 as follows:***

An ack-enabled A-MPDU is an A-MPDU with contents defined in Table 9-532b (A-MPDU contents in the HE ack-enabled immediate response context). (#20428, 20825)

NOTE—An ack-enabled A-MPDU does not contain more than one of the following frames: QoS Data frames, Manage-ment frame that solicits acknowledgment.

An HE STA shall not transmit an ack-enabled A-MPDU to a recipient STA unless it has received from the recipient STA an HE Capabilities element with the Ack-Enabled Aggregation Support subfield equal to 1.

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | **Resolution** |
| 20196 | 356 | 5 | "A STA that transmits an ack-enabled multi-TID A-MPDU that contains at least two MPDUs with differentTIDs carried in A-MPDU subframes that have the EOF field equal to 1 shall ignore the immediate responseif it is an Ack frame." doesn't cover all possible, legmitate case and discarding an ACK frame is not always right. E.g. if the recipient STA is only able to receive one S-MPDU and can respond with an ACK. The transmitter in this case should not discard the ACK as response. | Remove this paragraph. | **Revised****Discussion: In an ack-enabled multi-TID A-MPDU, a frame in an A-MPDU subframe with EoF field equal to 1 will always solicit Ack. When a STA that transmitted an ack-enabled multi-TID A-MPDU with two aggregated frames to solicit Ack receives a solicited Ack from the recepient, the transmitter can’t figure out which frame is correctly received by the recipient. The text about the following A-MPDU should also be added: one QoS Data frame and one Management frame in an Ack-enabled A-MPDU to solicit Ack.** **TGax editor to make changes in 11-19/1035r0 under CID 20196.** |
| 20330 | 355 | 48 | change "A non-ack-enabled multi-TID A-MPDU " to "An ack-enabled multi-TID A-MPDU" | As in comment. | Accepted |
| 20393 | 355 | 47 | A non-ack-enabled multi-TID A-MPDU is an A-MPDU with contents defined in Table 9-532d (A-MPDU contents in the HE ack-enabled multi-TID immediate response context).'should be ack-enabled multi-TID A-MPDU | remove 'non-' | Accepted |
| 20394 | 356 | 5 | A STA that transmits an ack-enabled multi-TID A-MPDU that contains at least two MPDUs with different TIDs carried in A-MPDU subframes that have the EOF field equal to 1 shall ignore the immediate response if it is an Ack frame.'If a rx is not certian how many TIDs in AMPDU, can the rx use MBA with ack type=1 and with a TID if the STA has only decoded 1 EOF-MPDU, to avoid this situation? Is using MBA in this case currently disallowed in the spec? | Add a note to clarify that rx STA could send a MBA to avoid this situation. | RevisedDiscussion: currently when an EoF-MPDU is received, the recipient is not allowed to transmit Multi-STA BlockAck. We can relax this requirement: when a STA that capable of receiving ack-enabled multi-TID A-MPDU receives a A-MPDU with single EoF MPDU from a STA that supports the transmission of ack-enabled multi-TID A-MPDU and at least one undetected A-MPDU subframe is longer than a frame with minimal length, the recipient can respond with Multi-STA BlockAck.**TGax editor to make changes in 11-19/1035r0 under CID 20394.**  |
| 20427 | 355 | 47 | Typo | Change "non-ack-enabled" to "ack-enabled" | Accepted |
| 21066 | 355 | 47 | The first sentence tries to define a non-ack enabled AMPDU by referring to the table for ack enabled AMPDU (that is, without the "non" present) - this cannot be correct. | Fix the reference to point to the correct table. | Revised. See the change proposed in 20427 |
| 21067 | 356 | 5 | The condition does not seem specific enough - the ACK should only be ignored if both TIDs require acknowledgement, but this might not be true. | Add a condition to the statement, per the comment. | **Revised****Discussion: In an ack-enabled multi-TID A-MPDU, a frame in an A-MPDU subframe with EoF field equal to 1 will always solicit Ack. When a STA that transmitted an ack-enabled multi-TID A-MPDU with two aggregated frames to solicit Ack receives a solicited Ack from the recepient, the transmitter can’t figure out which frame is correctly received by the recipient. The text about the following A-MPDU should also be added: one QoS Data frame and one Management frame in an Ack-enabled A-MPDU to solicit Ack.** **TGax editor to make changes in 11-19/1035r0 under CID 21067.** |
| 21137 | 355 | 47 | Section relates to "Ack-enabled multi-TID A-MPDU operation", but the first sentence refers to "A non-ack-enabled multi-TID A-MPDU" .Isn't it a "ack-enabled multi-TID A-MPDU" ? | Please confirm and modify accordingly. | Revised. See the change proposed in 20427 |
| 21607 | 356 | 5 | "A STA that transmits an ack-enabled multi-TID A-MPDU that contains at least two MPDUs with differentTIDs carried in A-MPDU subframes that have the EOF field equal to 1 shall ignore the immediate responseif it is an Ack frame." doesn't cover all possible, legmitate case and discarding an ACK frame is not always right. E.g. if the recipient STA is only able to receive one S-MPDU and can respond with an ACK. The transmitter in this case should not discard the ACK as response. | Remove this paragraph. | **Revised****Discussion: In an ack-enabled multi-TID A-MPDU, a frame in an A-MPDU subframe with EoF field equal to 1 will always solicit Ack. When a STA that transmitted an ack-enabled multi-TID A-MPDU with two aggregated frames to solicit Ack receives a solicited Ack from the recepient, the transmitter can’t figure out which frame is correctly received by the recipient. The text about the following A-MPDU should also be added: one QoS Data frame and one Management frame in an Ack-enabled A-MPDU to solicit Ack.** **TGax editor to make changes in 11-19/1035r0 under CID 21607.** |

**26.6.4.4 Ack-enabled multi-TID A-MPDU operation**

***TGax editor: change the last paragraph in 26.6.4.4 as follows:***

A STA that transmits an ack-enabled multi-TID A-MPDU that contains at least two MPDUs carried in A-MPDU subframes that are not from the same TID and have the EOF field equal to 1 shall ignore the immediate response if it is an Ack frame. (#20196, 21067, 21607)

**26.4.2 Acknowledgment context in a Multi-STA BlockAck frame**

***TGax editor: change the first paragraph in 26.4.2 as follows:***

A recipient of an A-MPDU shall set the Ack Type subfield and TID subfield in the Per AID TID Info field of the Multi-STA BlockAck frame sent as a response depending on the acknowledgment context as follows:

* An HE AP that receives an A-MPDU that includes one MPDU, and the MPDU is an EOF-MPDU that is a Management frame that solicits an acknowledgment prior to association may generate a Multi-STA BlockAck frame using the procedure described in the pre-association ack context defined below.
* An HE STA that receives an A-MPDU that does not include an EOF-MPDU but does include one or more non-EOF-MPDUs that are QoS Data frames with Ack Policy field equal to Normal Ack or Implicit Block Ack Request belonging to the same block ack agreement may generate a Multi-STA BlockAck frame as follows:
* If all MPDUs in the A-MPDU are received successfully, then the recipient may follow the procedure described in the all ack context as defined below.
* Otherwise, the recipient shall follow the procedure described in the BlockAck context defined below.
* An HE STA that supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1 decodes one EoF MPDU correctly in the received A-MPDU from an HE STA capable of transmitting ack-enabled multi-TID A-MPDU and the wrong decoded A-MPDU subframe is long enough for a valid MPDU, then the recipient may generate Multi-STA BlockAck frame with one Per AID-TID Info field with Ack Type subfield equal to 1. (#20394)
* An HE STA that supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes an EOF-MPDU that is a Management frame that solicits acknowledgment, and one or more MPDUs (either EOF-MPDUs or non-EOF-MPDUs) that are QoS Data frames with the Ack Policy field equal to Normal Ack, or Implicit Block Ack Request, then the recipient shall generate Multi-STA BlockAck frame as follows:
* If all the MPDUs in the A-MPDU are received successfully, then the recipient may follow the procedure described in the all ack context.
* Otherwise:
* For the MPDU that is a Management frame, the recipient shall create a Per AID TID info field using the procedure described below in Ack context with the TID value set to 15.
* For the EOF-MPDUs that are QoS Data frames, the recipient shall create a Per AID TID info field using the procedure described below in Ack context with the TID set to the TID of the QoS Data frame
* For the non-EOF-MPDUs that are QoS Data frames, the recipient shall create a Per AID TID info field using the procedure described below in BlockAck context with the TID set to the TID of the QoS Data frame
* An HE STA that supports multi-TID aggregation and if the A-MPDU does not include an EOF MPDU but does include non-EOF-MPDUs that are QoS Data frames with Ack Policy field equal Implicit Block Ack Request and are belonging to more than one block ack agreement, then the recipient shall generate a Multi-STA BlockAck frame as follows:
* If all MPDUs in the A-MPDU are received successfully, then the recipient may follow the procedure described in the all ack context
* Otherwise, for each TID included the received A-MPDU, the recipient shall create a per AID TID info field using the procedure described in BlockAck context with the TID set to the TID of the QoS Data frame