IEEE P802.11
Wireless LANs

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| LB225 11ax D1.0 Comment Resolution 27.10.4 – Part II |
| Date: 2017-05-25 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D1.0 with the following CIDs:

* 4795, 5696, 6031, 7606, 7607, 7608, 7609, 9731, 9948, 9949, 9950, 9951, 9952

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised to specifically identify the signalling of Multi-TID Aggregation Support in HE Capabilities and TID Aggregation Limit in Basic Trigger variant.
* Rev 2: Revised based on comments received from Robert on inclusion of an action frame in a Multi-TID A-MPDU content and other offline discussions; all revisions are highlighted in green.

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** |
| 4795 | 194 | 51 | Is the presence of an Action frame in the MT A-MPDU contained in the TB PPDU subject to the multi-TID aggregation limit? Seems not but just in case please clarify. Also please check that normative behaviors are not redundantly listed in different subclauses. From a quick check there is normatvie behavior that is redundant in different subclauses. | As in comment | **Revised**Agree in principle with the commenter; included a statement clarifying that the TID of an Action frame is not subjected to the value in the TID Aggregation LimitTGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 4795.  |
| 5696 | 194 | 40 | "when any of the buffers is empty", this part of the setnence does seem necessary and only adds confusion. | Remove "when any of the buffer is empty" | **Accepted**  |
| 6031 | 195 | 20 | Can a Multi-TID A-MPDU be transmitted as a response to Trigger frame which type is other than Basic Variant Trigger frame? | Please clarify may Multi-TID A-MPDU be transmitted as a response to any Trigger frame variant, except MU-RTS. | **Revised**Disagree in principle with the commenter; Multi-TID A-MPDU can only be transmitted in response to Basic Trigger frame. As such proposed resolution is to include a statement clarifying that a multi-TID A-MPDU is only transmitted by a non-AP STA when solicited only by a Basic Trigger frame whose TID aggregation limit value is greater than 0. A-MPDU already allows aggregation of QoS Null frames (with ACK policy set to No ACK) to report buffer status. Since BSRP Trigger frame does not include the Trigger Dependent User Info field, the TID Aggregation Limit and Preferred AC subfields are not relevant for aggregation of QoS Null frames. TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 6031  |
| 7606 | 194 | 19 | It is not clear whether Action frame accounts for a TID. | Clarify it | **Revised**Agree in principle with the commenter; included a statement clarifying that the TID of an Action frame is not subjected to the value in the TID Aggregation Limit as long as the TID Aggregation Limit is greater than 0, as the value 0 is used only to solicit immediate responses. TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 7606  |
| 7607 | 194 | 40 | "When any of the buffers is empty" is not right since this means when the buffer of one TID related to the primary AC is empty. | Change to "when the buffers of all TIDs related to the primay AC are empty." | **Revised** The phrase “when any of the buffers is empty” in the comment is removed from the sentence based on CID 5696 which also addresses this comment.  |
| 7608 | 194 | 51 | The paragraph at L51 is similar to the paragraph at L24. One of them should be removed. | As in comment | **Revised****Proposed resolution is to remove the paragraph cited in comment as instructed in this document 11-17/0688r2**TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 7608 |
| 7609 | 195 | 15 | The paragraph at P195 L15 is similar to the paragraph at P194 L24. One of them should be removed. | As in comment | **Revised**Agree in principle with the commenter; proposed change is to delete the paragraph in P194 L24 as in this documentTGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 7609 |
| 9731 | 195 | 6 | "When the AP specifies a value defined in Table 9-25i (Preferred AC subfield encoding) in the Preferred AC subfield and a value of 1 in the AC Preference Level subfield in the Trigger Dependent User Info field of a Basic Trigger variant Trigger frame, then an HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true may aggregate MPDUs from any other TID."The above paragraph is conflicted with the previous paragraph.Remove the corresponding paragraph. | As per comment | **Revised**Agree in principle with the commenter; modified the sentence to account for the case when there is no buffered data in any one of the TIDs from the AC indicated in the Preferred AC subfield; TGax editor to make the changes shown in 11-17/0688r2  |
| 9948 | 194 | 26 | Clarification is needed in case the soliciting Trigger frame is not the Basic Trigger variant. | As in the comment | **Revised**Agree in principle with the commenter; included a statement clarifying that a multi-TID A-MPDU is only transmitted by a non-AP STA when solicited only by a Basic Trigger. TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 9948  |
| 9949 | 195 | 6 | Not sure the difference between this paragraph and the previous paragraph. In other words, when "should" is used and when "may" is used for the same Trigger frame setting. Further clarification is needed, or delete this paragraph. | As in the comment  | **Revised**Agree in principle with the commenter; modified the sentence to account for the case when there is no buffered data in any one of the TIDs from the AC indicated in the Preferred AC subfield; TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 9949  |
| 9950 | 195 | 12 | This sentence is somewhat misleading. The aggregation rule depends on Preferred AC subfield and AC Preference Level subfield. But, this sentence just generalize the aggregation rule. Therefore, without further clarification, this sentence only makes the non-AP STA's behaviour vague and unclear. Further clarification is needed. | As in the comment | **Revised**Agree in principle with the commented; however, it is to be noted that the AC Preference Level subfield does not exist in Draft 1.2; revised the sentence to reflect on the case when there is no buffered data in any one of the TIDs within the preferred AC. TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 9950  |
| 9951 | 195 | 15 | This sentence is duplicate with paragraph in P194L51. | Delete the sentence in P195L15. | **Revised**Agree in principle with the commenter; modified the sentence to account for the case when there is no buffered data in any one of the TIDs from the AC indicated in the Preferred AC subfield; TGax editor to make the changes shown in 11-17/0688r2 under all headings containing CID 9951  |
| 9952 | 195 | 26 | This sentence is misleading. The behaviour mentioned is under the condition that AC Preference Level subfield is set to 1. | Modify the sentence to "An HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to false should select any one of the TID value within the AC value indicated in the Preferred AC subfield if AC Preference Level subfield is 1 in the Trigger Dependent User Info field of a Basic Trigger variant Trigger frame.". | **Revised** The AC Preference Level supfield has been removed from the draft. Proposed resolution is to remove the remaining presence of this field in the draf.t TGax editor to make the changes as shown in this document 11-17/0688r2 under all headings containing CID 9952 |

**27.10.4 A-MPDU with multiple TIDs**

***TGax editor: Modify the paragraphs in 27.10.4 as the following:***

An HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true shall set the Multi-TID Aggregation Support subfield of the HE Capabilities element it transmits to a nonzero value. Otherwise, the HE STA shall set it to 0.

An HE STA shall not send a multi-TID A-MPDU to an HE STA that has the Multi-TID Aggregation Support subfield in the HE Capabilities element equal to 0.

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An HE STA may aggregate in a multi-TID A-MPDU QoS Data frames with multiple TIDs as defined in Table 9-425 or Table 9-426.

(#CID 7609)If the multi-TID A-MPDU is transmitted in an HE TB PPDU, then the number of different TID values of QoS Data frames in the multi-TID A-MPDU shall not exceed the value of the number of TIDs value specified in the TID Aggregation Limit subfield in the Trigger Dependent User Info field of a Basic Trigger frame that allocated the resources for th~~e~~at HE TB PPDU. The Multi-TID A-MPDU may contain an Action frame if the TID Aggregation Limit is greater than 1 and the AP supports reception of Ack-enabled Multi-TID A-MPDU. (#CID 7606)

A multi-TID A-MPDU shall not be transmitted in an HE SU PPDU or HE ER SU PPDU, or HE UL MU PPDU, except when TXOP limit is not zero for the AC that is used to gain access to the medium. This AC is defined as the primary AC. When TXOP limit is not zero then the STA may aggregate QoS Data frames from one or more TIDs in the A-MPDU under the following conditions:

* The A-MPDU shall be carried in an HE SU PPDU or an HE ER SU PPDU transmitted within the obtained TXOP
* The A-MPDU shall contain one or more MPDUs with any of the TIDs that correspond to the primary AC
* (#CID 5696) When no more MPDUs can be aggregated in the A-MPDU from any of the TIDs that correspond to the primary AC then the A-MPDU may additionally contain one or more MPDUs with TIDs that do not correspond to the primary AC if the TIDs correspond to any AC that has a higher priority with respect to the primary AC and the addition of these MPDUs does not cause the STA to exceed the current TXOP duration

The Multi-STA BlockAck frame shall be used to acknowledge the MPDUs in a multi-TID A-MPDU. The rules for Multi-STA BlockAck are defined in subclause 27.4 (Block acknowledgement).

The responding HE STA shall not aggregate QoS Data frames in the A-MPDU or multi-TID A-MPDU with a number of TIDs that exceeds the value indicated in the TID Aggregation Limit subfield in the Trigger Dependent User Info field of a Basic Trigger variant Trigger frame (9.3.1.23.1 Basic Trigger) intended for it.

For an HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true and having a single A-MPDU containing MPDUs with different value of TIDs, the MPDUs with the same TID value may be aggregated in non-contiguous A-MPDU subframes.

When the AP specifies a value defined in Table 9-25i in the Preferred AC subfield (#3018)in the Trigger Dependent User Info field of a Basic Trigger frame, then an HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true and with buffered traffic in any one of the TIDs from (CIDs 9731, 9949, 9951) the indicated preferred AC should aggregate MPDUs from any one of the TIDs from the same AC or higher AC as indicated in the Preferred AC subfield of the Trigger Dependent User Info field in the Trigger frame.

When the AP specifies a value defined in Table 9-25i in the Preferred AC subfield (#3018)in the Trigger Dependent User Info field of a Basic Trigger frame, then an HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true and with no buffered traffic in any of the TIDs from the indicated preferred AC should aggregate MPDUs from any one of the TIDs from an AC that is higher than AC indicated in the Preferred AC subfield of the Trigger Dependent User Info field in the Trigger frame.(CIDs 9731, 9949, 9951).

NOTE -While the STA is recommended to transmit QoS Data from the AC that is same or higher than the preferred AC, the STA is still permitted to aggregate QoS Data from an AC lower than the preferred AC.

The STA may aggregate MPDUs from TIDs in other ACs within the remaining time to the HE TB PPDU duration value indicated in the Length subfield in the Common Info field of the received Trigger frame.

(CID 7608)When the AP indicates AC\_BK(#3018) in the Preferred AC (CID 9950, 9952) subfield in the Trigger Dependent User Info field of a Basic Trigger frame, then an HE STA with dot11AMPDUwithMultipleTIDOptionImplemented set to true may aggregate MPDUs from any AC/TID or combination of TIDs, up to the limit indicated in the TID Aggregation Limit subfield in Trigger Dependent User Info field of the Trigger frame.

An HE STA that intends to send QoS Data frames from a single TID should select a TID from the same or higher AC indicated in the Preferred AC subfield (#3018) in the Trigger Dependent User Info field of a Basic Trigger frame.

(CID 9949)

NOTE—A multi-TID A-MPDU allows the aggregation of an Action frame regardless of the value indicated either in the Multi-TID Aggregation Support subfield in the HE MAC Capabilities information field of the HE Capabilities element as long as the value of the TID Aggregation Limit subfield in the Trigger Dependent User Info field of the Basic Trigger frame is greater than 1 (CIDs 4795, 7606).

An HE AP may aggregate MPDUs from any TIDs in multi-TID A-MPDU for DL HE MU PPDU transmission and the number of TIDs in multi-TID A-MPDU shall not be more than the Multi-TID Aggregation Support announced by the recipient.