IEEE P802.11
Wireless LANs

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| LB230 CR of Multi-TID Capability Indication  |
| Date: 2018-01-10 |
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Abstract

This submission proposes resolutions of comments received from TGax LB230.

(The proposed change is based on TGax Draft 2.0.)

* CIDs: 13873, 11011, 11858, 12734, 12867, 13862, 12379, 12170, 12254, 12889 (10 CIDs)

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.***

| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 13873 | 135.10 | 9.4.2.237.2 | "Multi-TID Aggregation Support - Indicates the number of TIDs minus 1 of QoS Data frames that an HE STA can aggregate in a multi-TID A-MPDU as described in 27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU)."It is not clear what shall be supported by an HE STA. Shall an HE STA support to transmit a multi-TID A-MPDU? Or, shall an HE STA support to receive a multi-TID A-MPDU?  | Please clarify a requirement of this support field. | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0.  |
| 11011 | 135.10 | 9.4.2.237.2 | With respect to the Multi-TID Aggregation Supported subfield, it doesn't help to know what is the transmitter side capability. Instead this field should indicate the receiver side capability. | Change the meaning of this field to indicate receiver side capability - i.e., "Indicates the number of TIDs minus 1 of QoS Data frames that an HE STA is capable of receiving...." | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0. |
| 11858 | 135.10 | 9.4.2.237.2 | The "multi-TID aggregation support". Is this the capalibility of transmitting or receiving? Usually it's a capability of receiver, but the text seems like it is a capabilit of the transmitter. Please clarify. | Clarify. | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0. |
| 12734 | 135.10 | 9.4.2.237.2 | "Indicates the number of TIDs minus 1" -- the minus 1 should be in the encoding not the definition | Delete "minus 1" from the cited text | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0. |
| 12867 | 135.10 | 9.4.2.237.2 | "Multi-TID Aggregation Support" is not defined clearly | At the referenced location change "Indicates the number of TIDs minus 1 of QoS Data frames that an HE STA can aggregate in a multi-TID A-MPDU as described in 27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU)." to "Indicates the number of TIDs of QoS Data frames that an HE STA can receive in a multi-TID A-MPDU as described in 27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU)." and change "Set to the number of TIDs minus 1 of QoS Data frames that an HE STA can aggregate in a multi-TID A-MPDU." to "Set to the number of TIDs minus 1 of QoS Data frames that an HE STA can receive in a multi-TID A-MPDU. | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0. |
| 13862 | 94.8 | 9.3.1.23.1 | "… is the value indicated in the Multi-TID Aggregation Support subfield in the HE MAC Capabilities Information field in the HE Capabilities element transmitted by the AP that is the intended receiver of the User Info field."The intended receiver of the User Info field couldn't be an AP.  | As in comment.  | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0.  |
| 12379 | 94.06 | 9.3.1.23.1 | Remove the paragraph since it contradicts with the rules in subclause 27.5.3.2.3 | As in comment | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0.  |
| 12170 | 94.08 | 9.3.1.23.1 | The HE Capabilities element should be transmitted by the STA. Change "the AP" to "the STA" | as comment | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0.  |
| 12254 | 94.08 | 9.3.1.23.1 | The HE Capabilities element should be transmitted by the STA. Change "the AP" to "the STA" | as comment | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0.  |
| 12889 | 247.43 | 27.5.3.2.3 | "The AP shall set the value in the TID Aggregation Limit subfield in the Trigger Dependent User Info field to0 or 1 for an HE STA that has 0 in the Multi-TID Aggregation Support subfield" contradicts "An AP that sends a Basic Trigger frame may set the TID Aggregation Limit subfield of a User Info field thatis intended to a non-AP STA to any value between 0 and the most recently received Multi-TID AggregationSupport subfield": second implies AP must set to 0 if non-AP STA indicated 0, first allows AP to set to 1 | Delete "or 1" in the first sentence cited | Revised- Agree in principle. TGax editor makes changes as shown in the as specified in 11-18/105r0. |

**Discussion:**

In order to transmit a Multi-TID A-MPDU in an HE TB PPDU, an HE non-AP STA shall set the Multi-TID Aggregation Support subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits to a nonzero value.

* *The AP shall set the value in the TID Aggregation Limit subfield in the Trigger Dependent User Info field to 0 or 1 for an HE STA that has 0 in the Multi-TID Aggregation Support subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits and is identified by the AID12 subfield of the User Info field of a Basic Trigger frame (see 9.3.1.23 (Trigger frame format)). A value 0 in the TID Aggregation Limit subfield indicates to the STA that it shall not solicit any immediate response for the MPDUs that the STA aggregates in the HE TB PPDU. A value greater than 0 in the TID Aggregation Limit subfield indicates the number of TIDs that the STA can aggregate in the A-MPDU carried in the HE TB PPDU (see 27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU)).*

For transmitting a Multi-TID A-MPDU in an HE TB PPDU, an HE non-AP STA shall supports a reception capability of a Multi-TID A-MPDU in an HE (ER) SU PPDU or an HE MU PPDU. Because it set the Multi-TID Aggregation Support subfield to a nonzero value, a peer STA can transmits a Multi-TID A-MPDU in an HE (ER) SU PPDU or an HE MU PPDU to the HE non-AP STA.

* *A multi-TID A-MPDU is either a non-ack-enabled multi-TID A-MPDU or an ack-enabled multi-TID AMPDU. A first HE STA may transmit a non-ack-enabled multi-TID A-MPDU to a second HE STA if the first HE STA has received from the second STA an HE Capabilities element where the Multi-TID Aggregation Support subfield is nonzero. A first HE STA may transmit an ack-enabled multi-TID A-MPDU or a non-ack-enabled multi-TID A-MPDU to a second HE STA if the first HE STA has received from the second HE STA an HE Capabilities element where the Multi-TID Aggregation Support subfield is nonzero and where the Ack-Enabled Aggregation Support subfield is 1. Otherwise the first HE STA shall not transmit a multi-TID A-MPDU to the second HE STA.
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.*

In a summary, a reception of a Multi-TID A-MPDU in an HE (ER) SU PPDU or an HE MU PPDU is a conditional mandatory if an HE non-AP STA supports a transmission of a Multi-TID A-MPDU in an HE TB PPDU.

In order to decouple two functionalities (a Multi-TID A-MPDU in an HE (ER) SU PPDU and an HE MU PPDU, a Multi-TID A-MPDU in an HE TB PPDU), two solutions are possible.

First solution is that a non-AP STA does not provide the number of TIDs minus 1 of QoS Data frames that the non-AP STA can aggregate in a multi-TID A-MPDU.

Second solution is to define two Multi-TID Aggregation Support fields. First Multi-TID Aggregation Support field (3 bits) indicates the number of TIDs of QoS Data frames that a STA can receives in a multi-TID A-MPDU. Second Multi-TID Aggregation Support field indicates (3 bits) the number of TIDs of QoS Data frames that a STA can transmit in a multi-TID A-MPDU.

**9.4.2.237.2 HE MAC Capabilities Information field**

***TGax editor: change the sub-clause 9.4.2.237.2 as the following:***

**Table 9-262z—Subfields of the HE MAC Capabilities Information field *(continued)***

|  |  |  |
| --- | --- | --- |
| Multi-TID Aggregation Support | Indicates the number of TIDs ~~minus 1~~ of QoS Data frames that an HE STA can aggregate in a multi-TID A-MPDU as described in 27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU). | ~~Set to the number of TIDs minus 1 of QoS Data frames that an HE STA can aggregate in a multi-TID AMPDU.~~For an AP: Set to the number of TIDs minus 1 of QoS Data frames that an AP can receives in an HE SU PPDU and an HE ER SU PPDU.For a non-AP STA: Set to the number of TIDs minus 1 of QoS Data frames that a non-AP STA can receive in an HE SU PPDU, an HE ER SU PPDU and an HE MU PPDU if the Supported Multi-TID A-MPDU PPDU format is set to 1.Set to the number of TIDs minus 1 of QoS Data frames that a non-AP STA can transmit in an HE TB PPDU if the Supported Multi-TID A-MPDU PPDU format is set to 2. Set to the number of TIDs minus 1 of QoS Data frames that a non-AP STA can both receive in an HE SU PPDU, an HE ER SU PPDU and an HE MU PPDU and transmit in an HE TB PPDU if the Supported Multi-TID A-MPDU PPDU format is set to 3.  |

***TGax editor: insert the following into Table 9-262z:***

|  |  |  |
| --- | --- | --- |
| Supported Multi-TID A-MPDU PPDU format | Indicates the format of the PPDU in which an HE STA can receive or transmit a multi-TID A-MPDU. | Set to 1 if a STA supports to receive an HE SU PPDU, an HE ER SU PPDU and an HE MU PPDU carrying a multi-TID A-MPDU.Set to 2 if a STA supports to transmit an HE TB PPDU carrying a multi-TID A-MPDU. Set to 3 if a STA supports to receive an HE SU PPDU, an HE ER SU PPDU and an HE MU PPDU carrying a multi-TID A-MPDU and to transmit an HE TB PPDU carrying a multi-TID A-MPDU.Value 0 is reserved.  |

**9.3.1.23.1 Basic Trigger variant**

***TGax editor: change the sub-clause 9.3.1.23.1 as the following:***

…

The value in the TID Aggregation Limit subfield in Trigger frame is less than or equal to *MT* + 1, where *MT* is the value indicated in the Multi-TID Aggregation Support subfield in the HE MAC Capabilities Information field in the HE Capabilities element transmitted by the ~~AP~~ STA that is the intended receiver of the User Info field.

**27.5.3.2.3 Allowed settings of the Trigger frame fields and UMRS Control field**

***TGax editor: change the sub-clause 27.5.3.2.3 as the following:***

**…**

The AP shall set the value in the TID Aggregation Limit subfield in the Trigger Dependent User Info field to 0 or 1 for an HE STA that has 0 in the Multi-TID Aggregation Support subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits and is identified by the AID12 subfield of the User Info field of a Basic Trigger frame (see 9.3.1.23 (Trigger frame format)). A value 0 in the TID Aggregation Limit subfield indicates to the STA that it shall not solicit any immediate response for the MPDUs that the STA aggregates in the HE TB PPDU. A value greater than 0 in the TID Aggregation Limit subfield indicates the number of TIDs that the STA can aggregate in the A-MPDU carried in the HE TB PPDU (see 27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU)).

An AP that sends a Basic Trigger frame ~~may~~shall set the TID Aggregation Limit subfield of a User Info field that is intended to a non-AP STA that has a nonzero value in the Multi-TID Aggregation Support subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits to any value between 0 and the most recently received Multi-TID Aggregation Support subfield of an HE Capabilities element sent by the STA. A value of 7 in the TID Aggregation Limit subfield indicates to the STA that it may aggregate QoS Data frames from any number of different TID values in the multi-TID A-MPDU.