IEEE P802.11
Wireless LANs

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| LB 266 Resolution for CIDs related to MLO Block Ack Procedures |
| Date: July 7, 2022 |
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 Abstract

This submission proposes resolutions for following 14 CIDs received for TGbe LB266:

10639, 12295, 11259, 11611, 10001, 13330, 13909, 13910, 11054, 11053, 10347, 10348, 13911, 10086

**Revisions:**

* Rev 0: Initial version of the document.

***TGbe editor: The baseline for this document is 11be D2.0***

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

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

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

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| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 10639 | Abhishek Patil | 35.3.8 | 431.58 | The 1st paragraph is out of place - move it before the 5th paragraph (P432L32) in this subclause | As in comment | **Accepted****NOTE: to assist the editor, the necessary changes are shown in doc 11-22/1005r0 tagged 10639** |
| 12295 | Ryota Yamada | 35.3.8 | 431.58 | The word "originator MLD" and "recipient MLD" are used before definition at P432 L11-L12 "In this subclause, the MLD with data to send using the block ack mechanism is referred to as the originatorMLD, and the receiver of that data as the recipient MLD." | The "originator MLD" and "recipient MLD" should be described after the "In this subclause, the MLD with data to send using the block ack mechanism is referred to as the originator MLD, and the receiver of that data as the recipient MLD." | **Revised**Agree in principle with the comment. The 1st paragraph of this subclause is moved as a result of resolution to CID 10639. With this change, the definition of the terms occurs before the usage of the terms.**TGbe editor: Same resolution as CID 10639** |
| 11259 | Sigurd Schelstraete | 35.3.8 | 432.10 | This sentence defines "originator MLD" and "recipient MLD". However, the term "originator MLD" is already used earlier (e.g. page 431, line 58). Move definition to before first use of the term. | See comment | **Revised**Agree in principle with the comment. The 1st paragraph of this subclause is moved as a result of resolution to CID 10639. With this change, the definition of the terms occurs before the usage of the terms.**TGbe editor: Same resolution as CID 10639** |
| 11611 | Lei Wang | 35.3.8 | 432.10 | Define the terms, originator MLD and recipient MLD, before use them. | Suggest moving the sentence in line 10 page 432 to the beginning of this subclause, i.e., line 57 page 431. | **Revised**Agree in principle with the comment. The 1st paragraph of this subclause is moved as a result of resolution to CID 10639. With this change, the definition of the terms occurs before the usage of the terms.**TGbe editor: Same resolution as CID 10639** |
| 10001 | Lisa Ward | 35.3.8 | 431.62 | Minor editorial comment to improve readability of the sentence:"An originator MLD shall release transmit buffer associated with an successful received MPDU upon receiving BlockAck frame containing the reception status for that MPDU."e.g. insert 'the' before 'transmit', change 'an successful' to 'a successful'and consider changing 'successful' to 'successfully' | Consider changing the sentence as follows:"An originator MLD shall release the transmit buffer associated with a successfully received MPDU upon receiving BlockAck frame containing the reception status for that MPDU." | **Accepted****NOTE: to assist the editor, the necessary changes are shown in doc 11-22/1005r0 tagged 10001** |
| 13330 | Muhammad Kumail Haider | ï»¿35.3.8 | 431.62 | "ï»¿an successful received MPDU" -->"ï»¿a successfully received MPDU" | as in comment | **Accepted****NOTE: same resolution as CID 10001** |
| 13909 | Ming Gan | 35.3.8 | 432.12 | is the receiver MLD, please clarify it | clarify this receiver should be MLD | **Revised**Agree in principle with the comment. The cited sentence is revised to clarify receiving MLD. Furthermore, the paragraph was split to improve readability.**TGbe editor, please make changes as shown in 11-22/1005r0 tagged 13909** |
| 13910 | Ming Gan | 35.3.8 | 432.32 | change "and" to "together with", change "in" to "by" | change "and" to "together with", change "in" to "by" | **Revised**Agree in principle with the comment. The text is revised to indicate that the buffer size is a based on the (legacy) Buffer Size subfield of Block Parameter Set field and Extended Buffer Size field of the ADDBA Extension element.**TGbe editor, please make changes as shown in 11-22/1005r0 tagged 13910** |
| 11054 | Po-Kai Huang | 35.3.8 | 432.31 | It is ambiguous whether ADDBA extension element is always present for MLO. In 9.6.4.2 ADDBA Request frame format and 9.6.4.3 ADDBA Response frame format, ADDBA extension element is marked as optional. In the following sentence, "During the block ack agreement establishment, the buffer size per the Buffer Size field and the ExtendedBuffer Size field of the ADDBA Request frame is advisory.", it seems to imply that Extended Buffer Size field is always present, and as a result, ADDBA extension element is always present. One option to clarify the ambiguity is to clarify that ADDBA extension element may not be present for MLO, but if present, then the peer has to calculate buffer size based on the Extended Buffer Size field. | If the intention is that ADDBA extension element may not be present, then do the following revision. Add "(if present)" after "Extended Buffer Size field" in the following instances of 35.3.8 Block ack procedures in Multi-link operation: 432.33, 432.36, 432.37, 432.40, 432.48, 432.49, 432.53, Add the following. "When blockack is negotiated between two MLDs, if the ADDBA Extension element is present, then the Extended Buffer Size field of the ADDBA Extension element shall be present and the buffer size shall be specified based on the Buffer Size field and the ExtendedBuffer Size field of the ADDBA Resquest frame or ADDBA Response frame as described in 9.4.2.139 ADDBA Extension element." | **Revised**Agree in principle with the comment. Proposed resolution removes the ambiguity in this sentence by aligning the language with clause 9. As described in clause 9, the ADDBA Extension element is optionally carried in the ADDBA Request/Response frames. This behavior is unchanged by TGbe/MLO. When present, the (newly defined) Extended Buffer Size field is carried within this element (as defined in clause 9.4.2.139). The text in the cited paragraphs and the NOTE in between is updated to clarify this expected behavior.**TGbe editor, please make changes as shown in 11-22/1005r0 tagged 11054** |
| 11053 | Po-Kai Huang | 35.3.8 | 432.31 | It is ambiguous whether ADDBA extension element is always present for MLO. In 9.6.4.2 ADDBA Request frame format and 9.6.4.3 ADDBA Response frame format, ADDBA extension element is marked as optional. In the following sentence, "During the block ack agreement establishment, the buffer size per the Buffer Size field and the ExtendedBuffer Size field of the ADDBA Request frame is advisory.", it seems to imply that Extended Buffer Size field is always present, and as a result, ADDBA extension element is always present. One option to clarify the ambiguity is to mandate present of ADDBA extension element for MLD. | Add the following if the intention is to mandate ADDBA extension element for MLO. "When blockack is negotiated between two MLDs, ADDBA Extension element shall be present in ADDBA Request frame and ADDBA Response frame, the Extended Buffer Size field of the ADDBA Extension element shall be present, and the buffer size shall be specified based on the Buffer Size field and the ExtendedBuffer Size field of the ADDBA Resquest frame or ADDBA Response frame as described in 9.4.2.139 ADDBA Extension element.." | **Revised**Agree in principle with the comment. Proposed resolution removes the ambiguity in this sentence by aligning the language with clause 9. As described in clause 9, the ADDBA Extension element is optionally carried in the ADDBA Request/Response frames. This behavior is unchanged by TGbe/MLO. When present, the (newly defined) Extended Buffer Size field is carried within this element (as defined in clause 9.4.2.139). The text in the cited paragraphs and the NOTE in between is updated to clarify this expected behavior.**TGbe editor, please make changes as shown in 11-22/1005r0 tagged 11054** |
| 10347 | Tomoko Adachi | 35.3.8 | 432.33 | "During the block ack agreement establishment, the buffer size per the Buffer Size field and the Extended Buffer Size field of the ADDBA Request frame is advisory." Here, "is" should be "are". | As in comment. | **Rejected**The ‘is’ in this sentence refers to the buffer size value rather than the two fields which contribute towards this value. Hence it has to be singular. |
| 10348 | Tomoko Adachi | 35.3.8 | 432.35 | "..., the originator may change the size of its transmission window if ..."In the next paragraph, "(WinSizeO)" is appended to "transmission window". The "transmission window" is the same with it, so "(WinSizeO)" should be also appended here. | Change it to "..., the originator may change the size of its transmission window (WinSizeO) if ...", while making "WinSizeO" in italic.Also change "WinSizeO" in pp.ll 432.51 to italic. Or, delete "(WinSizeO)" in pp.ll 432.51, instead. | **Revised**Agree with the commenter. The WinSizeO at P432L51 is updated to italics and “(WinSizeO)” is added at P432L35.**TGbe editor, please make changes as shown in 11-22/1005r0 tagged 10348** |
| 13911 | Ming Gan | 35.3.8 | 432.48 | change "and" to "together with" and change "in" to "by" | change "and" to "together with" and change "in" to "by" | **Revised**Agree in principle with the comment. The text is revised to indicate that the buffer size is a based on the (legacy) Buffer Size subfield of Block Parameter Set field and Extended Buffer Size field of the ADDBA Extension element.**TGbe editor, please make changes as shown in 11-22/1005r0 tagged 13911** |
| 10086 | Xiangxin Gu | 35.3.8 | 432.58 | "Shall provide the reception status on the link on which the MPDU is received" is contradictory with "may provide the reception status on a different link" | change "shall" to "should" | **Rejected**The two sentences describe two different requirements at the receiving MLD. The first sentence mandates (shall) that the receiving MLD provides reception status of the MPDUs received on the link where BA is being transmitted. The second sentence states that a STA of the recipient MLD, that transmits the BA can (may) provide if available the status of successful reception of MPDUs received on another link. |

**35.3.8 Block ack procedures in Multi-link operation**

***TGbe editor: Please update the contents of the following paragraphs in this subclause as shown below:***

[10639]

An MLD shall follow the mechanisms defined in 11.5 (Block ack operation) and 35.4 (EHT acknowledgment procedure) with additional rules as defined in this subclause for performing block ack operation.

For each TID, there shall not be more than one block ack agreement established between two MLDs and the agreement shall apply to all the links to which the TID is mapped to (i.e., there are no independent block ack agreements for each TID on a per-link basis).

[13909]In this subclause, the MLD with data to send using the block ack mechanism is referred to as the *originator* MLD, and the MLD that is the intended recipient of that data is referred to as the *recipient* MLD. [***TGbe editor: Please note, the paragraph is split here*]**

To setup a block ack agreement between two MLDs, an originator MLD shall send an ADDBA Request frame through an affiliated STA to the recipient MLD, on any enabled link, indicating the TID for which the block ack agreement is being set up. The Block Ack Timeout field in the ADDBA Request frame is advisory. Upon receiving an ADDBA Request frame, the recipient MLD shall respond through an affiliated STA, on any enabled link, with an ADDBA Response frame subject to the power states of the STAs operating on the link. The recipient MLD has the option of accepting or rejecting the request. If the recipient MLD accepts the request, then a block ack agreement is established between the originator MLD and the recipient MLD for the TID specified in the ADDBA frames as defined in 10.25.2 (Setup and modification of the block ack parameters).

NOTE 1—An originator MLD can attempt a retransmission of an ADDBA Request frame on any enabled link. A recipient MLD can attempt a retransmission of an ADDBA Response frame on any enabled link.

If an MLD has established a block ack agreement with another MLD, then QoS Data frames for the TID associated with the block ack agreement may be exchanged between the two MLDs on any link to which the TID is mapped by following the procedure described in 35.3.7.1 (TID-to-link mapping) and 35.3.12 (Multi-link power management).

[10639][10001]the [10001]a[10001]ly

During the block ack agreement establishment, the buffer size [13910]indicated based on the Buffer Size subfield (of the Block Ack Parameter Set field) together with the Extended Buffer Size field [11054](when ADDBA Extension element is included) in the ADDBA Request frame is advisory. After a block ack agreement is established between two MLDs, the originator may change the size of its transmission window [10348](*WinSizeO*) if the buffer size [13910]indicated based on the Buffer Size field [13910]together with the Extended Buffer Size field [11054](if present) of the ADDBA Response frame is larger than the buffer size indicated based on the Buffer Size field and the Extended Buffer Size field [11054](if present) of the ADDBA Request frame so that the transmit window meets the following conditions:

* Not greater than the buffer size indicated in the Buffer Size field [13910]together with the Extended Buffer Size field [11054](if present) of the ADDBA Response frame.
* Not greater than 1024 if the sender and receiver of the ADDBA Response frame are MLDs.

[11054]NOTE 2— The ADDBA Extension element is optionally present in an ADDBA Request or ADDBA Response frame (see 9.6.4 (Block Ack Action frame details)). When block ack agreement is negotiated between two MLDs, if ADDBA Extension element is present, then the total buffer size is computed as described in 9.4.2.139 (ADDBA Extension element).

If the buffer size [13911]indicated based on the Buffer Size field [13911]together with the Extended Buffer Size field [11054](if present) of the ADDBA Response frame is smaller than the buffer size [13911]indicated based on the Buffer Size field [13911]together with the Extended Buffer Size field [11054](if present) of in the ADDBA Request frame, the originator shall change the size of its transmission window [10348](*WinSizeO*) so that it meets the following condition: [***TGbe editor: Please note, WinSizeO updated to italics #10348*]**

* Not greater than the buffer size [13911]indicated based on the Buffer Size field [13911]together with the Extended Buffer Size field [11054](if present) of the ADDBA Response frame.
* Not greater than 1024 if the sender and the receiver of the ADDBA Response frame are MLDs.