IEEE P802.11
Wireless LANs

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| CC36 comment resolution for miscellaneous comments part 1 |
| Date: 2022-03-27 |
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Abstract

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

 4274, 4368, 4369, 4370, 5383, 6673, 6711, 6944,7829,7830

 4297, 4298, 4337, 5026

 4303, 6028

 5160, 6503, 6505, 5986, 6206

7873, 7596, 7597, 7598, 7599, 5987, 5611

Revisions:

* Rev 0: Initial version of the document.

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** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 4274 | 181 | 32 | Please move MLD stuff to MLD blockack. | As in comment. | RevisedGenerally agree with the commenter. The related paragraph will be moved to subclause **35.3.8 Block ack procedures in Multi-link operation**.TGbe editor to make changes in this document under CID 4274 |
| 4368 | 181 | 32 | Compared to 802.11ax D8.0, the case where the value in the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is larger than the value in the ADDBA Request frame, the originator may change the size of its transmission window under the following conditions (which are absent from current text):1. It will not be greater than the value in the Buffer Size field of the ADDBA Response frame2. It will not be greater than 1 024 if the sender of the ADDBA Response frame is an EHT STA | Add the 2 conditions after the following text " ...the originator may change the size of its...is larger than the value in the ADDBA Request frame".preferred way - like in 802.11ax D8.0: separate the paragraph into 2 sub-paragraphs: one for the case the value is smaller than the one in the ADDBA Response and the other to the case where the value is greater than the one in the ADDBA Response and each sub-paragraph will include the relevant conditions | RevisedTGbe editor to make changes in this document under CID 4368 |
| 4369 | 181 | 34 | According to 9.4.2.139 (P70L19),"The Extended Buffer Size field together with the Buffer Size subfield in the Block Ack Parameter Set field indicates the number of buffers available for this particular TID".Thus, the following sentence is not clear: "If the value in the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is smaller than the value in the ADDBA Request frame" - do you refer to the individual values of each of these fields or to the Negotiated Buffer Size value which is composed from a combination of these fields? | Use the term "Negotiated buffer size" (already used in section 35.3.7.2.2) and add clarification that the criteria for this condition is the Negotiated buffer size value which is equal to Extended buffer Size \* 1024 + buffer Size. | RevisedTGbe editor to make changes in this document under CID 4369 |
| 4370 | 181 | 36 | Compared to 802.11ax D8.0, additional condition shall be added in case that " the value in the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is smaller than the value in the ADDBA Request frame, the originator shall change the size of its transmission window so that it will not be greater than the value in the Buffer Size field of the ADDBA Response frame" | Add this condition to the text (supplement to the other condition already specified there). | RevisedTGbe editor to make changes in this document under CID 4370 |
| 5383 | 181 | 23 | 11be shall define an mechanism to address to overhead issue of the longer BA | The commenters will provide a solution on this. | RejectedDiscussion: In 11ax, 256BA bitmap size was introduced, and TGax members decided to use 256BA bitmap size without optimization. In 11be 1024 BA bitmap size was introduced. However compared with A-MPDU aggregated with 1024 MPDUs, the overhead of 1024 BA bitmap +1024 A-MPDU is smaller than the usage of 256 A-MPDU + BA with 256 BA bitmap size.  |
| 6673 | 181 | 34 | Reference to 'Extended Buffer size' is not available in 10.25.2 | Please provide reference for Extended Buffer size field | RevisedThe reference to 9.4.2.139 was addedTGbe editor to make changes in this document under CID 6673 |
| 6711 | 181 | 32 | "When a block ack agreement is established between two MLDs, the originator may change the size of its transmission window if the value in the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is larger than the value in the ADDBA Request frame. If the value in the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is smaller than the value in the ADDBA Request frame,..."Although the intention can be inferred, it is not clear that the values of two different fields: the Extended Buffer Size field and the Buffer Size field indicates the buffer size. It will be clearer if the buffer size is explicitly mentioned. | Rephrase as:"When a block ack agreement is established between two MLDs, the originator may change the size of its transmission window if the buffer size indicated by the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is larger than the buffer size indicated in the ADDBA Request frame. If the buffer size indicated by the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is smaller than the buffer size indicated in the ADDBA Request frame,..." | RevisedTGbe editor to make changes in this document under CID 6711 |
| 6944 |  |  | Does MLD STA has new constraints in selecting BlockAck and BlockAckReq variants. Since the transmitter is not aware of receiver full/partial state support, it may select ack method that may degrade multi-link performance | Please clarify | Rejected10.25.5 is about the selection of the Block AckRequest variants (Multi-TID BlockAckRequest, Compressed BlockAckRequest, GCR BloakAckRequest etc.), BlockAck variants (Multi-TID BlockAck, Compressed BlockAck, GCR BloakAck etc.). The BlockAckRequest variant and BlockAck variant of EHT STA is same as 11ax STA, e.g. compressed BlockAckRequest and Multi-TID BlockAckRequest, compressed BlockAck and Multi-STA BlockAck will be used.  |
| 7829 |  |  | Following the motion 112, #SP7 marked in 20/1935r33 of extending the BA bitmap size up to 1024, some changes are neglected which makes people confused. | Add "subjects to the following conditions: Not greater than 1024 if the sender and receiver of the ADDBA Response frame are EHT STAs" after the text "if the value in the Extended Buffer Size field and the Buffer Size field of the ADDBA Response frame is larger than the value in the ADDBA Request frame." | RevisedTGbe editor to make changes in this document under CID 7829 |
| 7830 |  |  | It should be "Not greater than 1024 if the sender and receiver of the ADDBA Response frame are EHT STAs" | As commented. | RevisedTGbe editor to make changes in this document under CID 7830 |

***TGbe editor: please delete the following subclause changes from the draft: (#4274)***

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

***TGbe editor: please add the following paragraph as the 6th paragraph in 35.3.8:***

***(#4274)*** 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. After a block ack agreement is established between two MLDs, the originator may change the size of its transmission window if the buffer size specified in the Buffer Size field and the Extended Buffer Size field of the ADDBA Response frame is larger than the buffer size per the Buffer Size field and the Extended Buffer Size field of the ADDBA Request frame so that the tranmsit window meets the following conditions: (#4369, ***6711***)

* Not greater than the buffer size indicated in the Buffer Size field and the Extended Buffer Size field of the ADDBA Response frame. (#4368, ***4370***)
* Not greater than 1024 if the sender and receiver of the ADDBA Response frame are MLDs (#***7829***)

**(#6673)** NOTE—The Extended Buffer Size field is included in the ADDBA Extension element, defined in 9.4.2.139, contained in an ADDBA Request or ADDBA Response frame.

If the buffer size specified in the Buffer Size field and the Extended Buffer Size field of the ADDBA Response frame is smaller than the buffer size specified in the Buffer Size field and the Extended Buffer Size field of in the ADDBA Request frame, the originator shall change the size of its transmission window (WinSizeO) so that it meets the following condition: (#4369, ***6711***)

* Not greater than the buffer size per the Buffer Size field and the Extended Buffer Size field of the ADDBA Response frame. (#4368, ***4370***)
* Not greater than 1024 if the sender and the receiver of the ADDBA Response frame are MLDs. (#***7830***)

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 4297 |   |   | Please add a reference to normative subclause where these extensions are used (in EHT). | As in comment. | RevisedTGbe editor to make the following changes in 9.4.2.139 |
| 4298 |   |   | Additional implies that there are others before it. But there arent. Suggest to just call this field ADDBA Parameter Set. | As in comment. | Revised TGbe editor: please change “ADDBA Additional Parameter Set” to “ADDBA Extneded Parameter Set” through the draft. |
| 4337 | 123 | 37 | In the following sentece, the term "buffer size" is used twice in different meanings: "The Extended Buffer Size field together with the Buffer Size subfield in the Block Ack Parameter Set field indicates the number of buffers available for this particular TID where the \*buffer size\* is Extended Buffer Size × 1024 + \*Buffer Size\*"Thus, need to use different terminology | The sentence should be revised as follows: "The Extended Buffer Size field together with the Buffer Size subfield in the Block Ack Parameter Set field \*indicate the negotiated buffer size, i.e.\* the number of buffers available for this particular TID.The \*negotiated\* buffer size \*value\* is Extended Buffer Size × 1024 + Buffer Size" | Rejected The “buffer size” is the value of tranmit window, while “Buffer Size” is the field name. |
| 5026 | 123 | 37 | The description of the Extended Buffer size is unclear: what is the number of buffers? Why is its size 3 bits but not 2? | As in comment | RejectedThe number of buffers is used in baseline spec, e.g. in the following sentence, “The Buffer Size subfield indicates the number of buffers available for this particular TID”. The Size 3 provides enough value for the future extension. |

**9.4.2.139 ADDBA Extension element**

***TGbe editor: please make the following change in 9.4.2.139:***

The Extended Buffer Size field together with the Buffer Size subfield in the Block Ack Parameter Set field indicates the number of buffers available for this particular TID, which is negotiated as defined in **35.3.8 (Block ack procedures in Multi-link operation) (#4297)** where the buffer size is Extended Buffer Size **×** 1024 + Buffer Size.

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 4303 |   |   | Propose adding a subclause in 36, which contains the BW negotiation for EHT, call out baseline there and add appropriate exceptions (such as these ones). | As in comment. | RevisedIn 11be D1.5, BW negotiation for EHT through MU-RTS/CTS is added as 35.2.2 MU-RTS trigger/CTS frame exchange procedure for EHT STAs. The RTS/CTS for EHT BW negotiation was added in 10.3.2.No further changes are needed. |
| 6028 | 166 | 20 | This change is not enough. The intra-BSS/inter-BSS NAVs, TB (TB PPDU, TB NDP) are introdcued by 11ax. In sounding the sounding feedback could be the responding frame. Those operation should be changed accordingly. | As in comment | RejectedThe comment that is related to the features introduced by 11ax should be addressed in 11me.  |

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 5160 | 261 | 37 | Make 256BA mandatory for EHT STAs | As in the comment | RejectedThe group can’t get the consensus that 256 BA is mandatory requirement at EHT STA. |
| 6503 | 261 | 40 | A block ack agreement between two MLDs shall apply to all links currently supporting the TID, and there is no independent block ack agreement on per-link basis. Nevertheless, it is generally admitted than acknowlegments provide deficiencies in low latency delivery (e.g. unuseful retransmissions for aging-elapsed data, head-of-line blocking if missing packets at destination, double acknowlegment protocols: TCP over 802.11, etc).Therefore, there is a need to avoid retransmission of low latency data (STA can transmit faster and without reliability such data), but keeping retransmission for other data of same TID. | Provide a latency sensitive delivery for latency sensitive data traffic : this is to be addressed for a TID having block ack agreement enabled, and including also traffic that is not latency sensitive. | RejectedWith Ack requirement for low latency traffic under BA agreement, the retransmission is not mandatory, e.g. after receiving BA of an A-MPDU, the origintor MLD can transmit a new A-MPDU where all MPDUs in the new A-MPDU have new SNs if it doesn’t want to retransmit the MPDUs that are not correctly received by recipient MLD. Under BA agreement, the originator MLD can keep transmitting A-MPDUs without soliciting BA and without the retransmission of any MPDUs through setting Ack Policy of the MPDUs to Block Ack.  |
| 6505 | 261 | 40 | According to Table 9-13--Ack policy, No Ack row "is not used for QoS Data frames with a TID forwhich a block ack agreement exists".Therefore all traffic of a TID shall follow same ACK policy, which is a pity when only subset of traffic is latency sensitive.There shall be a means to avoid ACK penalties for latency sensitive data, as the head-of-line blocking at the recipient re-ordering buffer. | Provide a means at recipient to avoid queuing latency sensitive data (re-ordering buffer), but immediately deliver it to upper layer. | RejectedWith Ack requirement for low latency traffic under BA agreement, the retransmission is not mandatory, e.g. after receiving BA of an A-MPDU, the origintor MLD can transmit a new A-MPDU where all MPDUs in the new A-MPDU have new SNs if it doesn’t want to retransmit the MPDUs that are not correctly received by recipient MLD. Under BA agreement, the originator MLD can keep transmitting A-MPDUs without soliciting BA and without the retransmission of any MPDUs through setting Ack Policy of the MPDUs to Block Ack.  |
| 5986 | 261 | 48 | The BA agreement between two MLDs should be initiated by a MLD through its affiliated STA. | As in comment | RevisedTGbe editor to make changes in this document under CID 5986 |
| 6206 | 261 | 48 | The text is unclear on whether it refers to the affiliated STAs or the MLDs. It looks like the intention is to establish a BS between MLDs. | Change "To setup a block ack agreement between two MLDs, a STA of the originator MLD sends an ADDBA Request frame, on any enabled link, indicating the TID for which the block ack agreement is being set up. The Buffer Size and Block Ack Timeout fields in the ADDBA Request frame are advisory. A STA of the recipient MLD shall respond with an ADDBA Response frame. The recipient MLD has the option of accepting or rejecting the request. If the recipient MLD accepts the request, then a block ack agreement exists between the originator MLD and recipient MLD for that TID as defined in 10.25.2 (Setup and modification of the block ack parameters)."to"To establish a block ack agreement between two MLDs, a originator MLD sends an ADDBA Request frame by transmitting the frame through an affiliated STA, indicating the TID for which the block ack agreement is being set up. The Buffer Size and Block Ack Timeout fields in the ADDBA Request frame are advisory. The recipient MLD that receives the ADDBA request through an affiliated STA shall respond with an ADDBA Response frame. The recipient MLD has the option of accepting or rejecting the request. If the recipient MLD accepts the request, then a block ack agreement exists between the originator MLD and recipient MLD for that TID as defined in 10.25.2 (Setup and modification of the block ack parameters). | RevisedTGbe editor to make changes in this document under CID 6206 |

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

***TGbe editor: please make the following change in 4th paragraph in 35.3.8:(#5986, 6206)***

(#2870)(#2871)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. To setup a block ack agreement between two MLDs, an originator MLD (#1930)shall send an ADDBA Request frame (#1931) 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. (#1932)(#1686)(#1446)(#1427)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).

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 7873 | 262 | 1 | In case of NSTR operation, there is a case where a BlockAck can not be transmitted on one link while the other link is receiving a PPDU. In this case, the BlockAck may be transmitted after the reception of PPDU on the other link or may be transmitted together with the BlockAck the other link. When start time or endtime is not synchronized, NSTR BlockAck procedure needs to be defined. | As in the comment. | Rejected11be draft allow recipient MLD to transmit BA in one link to carry the acknowledgement information of A-MPDU received in another link. When a BA can’t be transmitted in one link because of another link’s transmission or reception because of the two links belong to NSTR link pair, it can be treated as collision. |
| 7596 | 262 | 6 | The current spec (10.25.6.5) allows to set any value for the status between the SSN of the BA frame and adjusted WinStart\_R, if the adjusted WinStart\_R is greater than the SSN of the BA frame. The scoreboard context control is supposed to be at least in the link level MAC (lower MAC), but when responding like this, will the MLD level MAC (higher MAC) also hold the combined scoreboard state among the enabled links? Then, which WinStart\_R is applied when responding at a link? The combined one, I think. And the above rule in 10.25.6.5 should apply. Such clarification is needed. | As in comment. |  |
| 7597 | 262 | 10 | "An originator MLD shall update the receive status for an MPDU corresponding to a block ack agreement if ..." The "receive status" here should be block ack state or transmit buffer state. | As in comment. | RevisedThis can be addressed by using the followingtext in baseline spec “the status of MPDUs in its transmit buffer”.TGbe editor to mke changes in this document under CID 7597 |
| 7598 | 262 | 10 | While it is obvious from this statement that an originator MLD shall maintain a single common transmit buffer, I think it should be clarified after the paragraph starting with "A recipient MLD shall maintain a single common receive reordering buffer ... ." | As in comment. | RejectedThe following text was already in D1.0,“A recipient MLD shall maintain a single common receive reordering buffer for each <peer MLD, TID> tuple under a block ack agreement, independent of the number of links that are setup.” |
| 7599 | 262 | 13 | "An originator MLD shall not update the receive status for an MPDU corresponding to a block ack agreement that ..." The "receive status" here should be block ack state or transmit buffer state. | As in comment. | RevisedThis can be addressed by using the followingtext in baseline spec “the status of MPDUs in its transmit buffer”.TGbe editor to mke changes in this document under CID 7599 |
| 5987 | 262 | 13 | Change "An originator MLD shall not update the receive status for an MPDU corresponding to a block ack agreement that has already been positively acknowledged." to "An originator MLD shall not update the receive status for an MPDU corresponding to a block ack agreement that has not already been positively acknowledged.". | As in comment | RejectedDiscussion:if the sttus of a MPDU is not positively acknowledged, it should be updated since the following transmission of the MPDU may be correct. |
| 5611 | 262 | 20 | Text refers to "received sequence number" which is confusing because sequence number is assigned by initiator (transmitter). | Replace word "received" with "assigned" | RejectedDiscussion: at recipient /MLD, the sequence number is the received sequence number. |

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

***TGbe editor: please make the following changes in 35.3.8:***

……

An originator MLD shall update the reception status of an MPDU in its transmit buffer corresponding to a block ack agreement if the received status indicates successful reception.(#7597)

An originator MLD shall not update the reception status of an MPDU in its transmit buffer corresponding to a block ack agreement that has already been acknowledged as successful. .(#7599)

……