IEEE P802.11
Wireless LANs

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| LB275 11be D4.0 comment Misc. CIDs |
| Date: 2023-08-23 |
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Abstract

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

 19166, 19225, 19226, 19235, 19456, 19474

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 |
| 19166 | 1028 |   | Figure AF-52 describes the condition of a stand-by mode after the BA frame, probably intending that the TXOP ended with the transmission of the BA frame. But it is not described by the sentences in AF.15. | Add description to align with Figure AF-52. Also show the TXOP in Figure AF-52 so that why the condition at the EMLMR STA changed is clear. | RevisedGenerally agree with the commenter. Accounted for the suggested changes.TGbe editor to make changes in THIS DOCUMENT with CID tag 19166 |
| 19225 | 355 | 35 | The text "If the intended receiver is an HE or EHT STA, an HE or EHT STA" places a retroactive requirement on HE STAs that they be aware of the existance of EHT STAs. | Given that EHT STAs are HE STAs, can drop both instances where "or EHT" is inserted. Alternatively, can revise to "If the intended receiver is an HE STA, an HE or EHT STA shall not start the transmission of more than one QoS Data frame." In either case, could add a reminder note that EHT STAs are HE STAs (like NOTE 2 on page 360) | RevisedGenerally agree with the commenter. Accounted for the suggested changes.TGbe editor to make changes in THIS DOCUMENT with CID tag 19225 |
| 19226 | 356 | 5 | As written, the text of NOTE 2 suggests that specific STAs are HT STAs, rather than all members of each class are HT STAs | Rephrase as "As VHT STAs, HE STAs, and EHT STAs are HT STAs | Accepted |
| 19235 | 477 | 32 | Not sure what the phrase "CTS frame response" means. It is not used elsewhere in the base spec. | Remove "response" | Accepted |
| 19456 | 359 | 55 | Please clarify the BA timeout for MLD | Add text in 10.25.4, saying "if a BA agreement is steup between two MLDs, then the block ack agreement may be torn down if there are no BlockAck, BlockAckReq, or MPDUs received from the peer under the block ack agreement on any of the setup link(s), for the block ack's TID, within a duration of block ack timeout value" | RevisedDiscussion: generally agree with the commenter. However the text should be added to 35.3.8.TGbe editor to make changes in THIS DOCUMENT with CID tag 19456 |
| 19474 | 57 | 28 | The phrase "the receiving STA's receiving capabilities" should be referring to affiliated STAs. | Change "the receiving STA's receiving capabilities" to "the affiliated STA's receiving capabilities" | RevisedGenerally agree with the commenter.TGbe editor to make changes in THIS DOCUMENT with CID tag 19474 |

**AF.15 Examples of enhanced multi-link multi-radio operation**

***TGbe editor: please change the first paragraph in AF.15 as follows: (#19166)***

Figure AF-52 (An example of a frame exchange sequence between an AP affiliated with an AP MLD and an EMLMR STA affiliated with a non-AP MLD) gives an example of frame exchange sequences in a TXOP that starts with a QoS Null frame between an AP affiliated with an AP MLD and an EMLMR STA affiliated with a non-AP MLD and ends with a BlockAckframe. The non-AP MLD switches its spatial streams from the other EMLMR link(s) to the EMLMR link where the QoS Null frame is received after finishing the decoding of QoS Null frame. The AP selects the NSS, MCS of the PPDU carrying the QoS Null frame that are supported in the Supported EHT-MCS And Nss Set field of the EHT Capabilities element announced by the EMLMR STA. The AP selects the NSS, MCS of the PPDU carrying the A-MPDU that are supported in the EMLMR Supported MCS And Nss Set field of the EML Control field announced by the EMLMR STA.

***TGbe editor: please change Figure AF-46 as follows: (editor note: the changes are in red) (#19166)***

TXOP

QoS Null

Ack

A-MPDU

BA

AP affiliated with AP MLD

EMLMR STA affiliated with

non-AP MLD

SIFS

(#15921, 16428, 15129)non-AP MLD does the Nss switch from the EMLMR link where the QoS Null is received to the other EMLMR link(s).

(#15921, 16428, 15129) non-AP MLD does the Nss switch from the other EMLMR link(s) to the EMLMR link where the QoS Null is received.

**Figure AF-46—An example of a frame exchange sequence between an AP affiliated with an AP MLD and an EMLMR STA affiliated with a non-AP MLD(#15157)**

SIFS

SIFS

**10.12.3 Minimum MPDU start spacing rules**

**TGbe editor: please change the first paragraph in 10.12.3 as follows:**

(#19225)If the intended receiver is a non-HE STA, a STA shall not start the transmission of more than one MPDU within the time limit described in the Minimum MPDU Start Spacing field declared by the intended receiver. If the intended receiver is an HE STA, an HE STA shall not start the transmission of more than one QoS Data frame, QoS Null frame, or Management frame within the time limit described in the Minimum MPDU Start Spacing field declared by the intended receiver. To satisfy this requirement, the number of octets between the start of two consecutive MPDUs in an A-MPDU, N, measured at the PHY SAP, shall meet the condition defined by [Equation (10-12)](#bookmark13).



*N*  







*tMMSS*  *r*  8

*MMSF*

*t*  2

*MMSS*

 *r*  8

if the A-MPDU is not carried in an HE TB PPDU or EHT TB PPDU

(10-12)

if the A-MPDU is carried in an HE TB PPDU or EHT TB PPDU

where

*tMMSS* is the time (in microseconds) defined in the Encoding column of Table 9-223 (Subfields of the A-MPDU Parameters field) for an HT STA, of Table 9-343 (Subfields of the S1G Capabilities Information field) for an S1G STA for the value of the Minimum MPDU Start Spacing field,

and of Table 9-289(Subfields of the A-MPDU Parameters subfield) for a DMG STA for the

value of the Minimum MPDU Start Spacing field

*MMSF* is the value of the MPDU MU Spacing Factor subfield of the User Info field addressed to the HE or EHT STA in the Trigger frame soliciting the HE TB PPDU or the EHT TB PPDU (see

9.3.1.22 (Trigger frame format))

*r* is the value of the PHY Data Rate (in megabits per second) defined in 19.5 (Parameters for HT-MCSs) for HT PPDUs, in 21.5 (Parameters for VHT-MCSs) for VHT PPDUs, in

23.5 (Parameters for S1G-MCSs) for S1G PPDUs, and in Clause 20 (Directional multi-gigabit (DMG) PHY specification) for a DMG STA

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

***TGbe editor:Please add the following pafagraph at the end of 35.3.8:***

(#19456) A block ack agreement between two MLDs may be torn down if there are no BlockAck, BlockAckReq, or MPDUs received from the peer under the block ack agreement on any setup link(s) on which the TID for the block ack agreement is mapped for the direction matching the BA agreement, within a duration of block ack timeout value (see 11.5.4 (Error recovery upon a peer failure).

**3.2 Definitions specific to IEEE 802.11**

***TGbe editor:Please add the EMLMR definition in 3.2 as follows:***

**(#19474) enhanced multi-link multi-radio (EMLMR) operation:** [EMLMR operation] A mode of operation that allows a non-access point (non-AP) multi-link device (MLD) with multiple receive chains to listen on a set of enabled links when the corresponding non-AP stations (STAs) affiliated with the non-AP MLD are in awake state for an initial frame sent by an AP affiliated with an AP MLD to one of the receiving non-AP STAs in a physical layer (PHY) protocol data unit (PPDU) whose Nss satisfy that receiving non-AP STA’s receiving capabilities, followed by frame exchanges that sat­isfy the MCS, Nss capabilities in EMLMR mode on the link on which the initial frame was received.