IEEE P802.11
Wireless LANs

|  |
| --- |
| LB275 CR 35.3.18 part 2 and other CIDs |
| Date: 2023-09-07 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Liwen Chu |  |  |  | Liwen.chu@nxp.com |

Abstract

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

 19334, 19571, 19585, 19841, 19844, 19845, 19878

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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 19334 | 582 | 26 | Spurious language: preamble at P582L22 clearly limits the discussion to "A BA agreement that is set up between two EHT STAs where at least one of them is not affiliated with the MLD" yet almost identical language is repeated at L26 | At L26, delete "When a block ack agreement is established between two EHT STAs where at least one of them is not affiliated with the MLD" | Accepted |
| 19571 | 318 | 31 | When the non-AP MLD intend to enable EMLMR mode by transmiting an EML Operting Mode Notification frame to its associated AP MLD, EMLMR parameter, such as EMLMR Padding Delay or EMLMR Transition Delay, should optionally be included in the EML Operting Mode Notification frame if the non-AP MLD wishes to update. | As in comment | RevisedDiscussion: Generally agree with the commenter.TGbe editor to make change in THIS DOCUMENT with tag 19571 |
| 19585 | 938 | 49 | EMLMR configuration is missing | add EMLMR configuration | RejectedDiscussion: the commenter asked to add EMLMR configuration based on the EMLMR configuration at P938L59. However there is no EMLMR configuration in subclause 35.3.17. |
| 19841 | 568 | 31 | This sentence is too long and is hard to read due to lack of appropriate punctuations. Consider rephrasing. | Consider breaking into two sentences as follows: "The EMLMR operation defined in this subclause allows a non-AP MLD with multiple radios in multiple links to listen on a set of links as defined below for an initial frame sent by an AP affiliated with an AP MLD, followed by frame exchanges that satisfy the MCS and NSS capabilities in the EMLMR mode on the link on which the initial frame was received. Here initial frame is transmitted in a PPDU whose NSS satisfies the receiving STA's capabilities." | Accepted |
| 19844 | 569 | 55 | The Operating Mode Notification and Operating Mode Indication procedures can be used to change both the NSS and the bandwidth of a link. When the operating mode is changed after a non-AP MLD switches to EMLMR mode, it has to be clarified which of these changes are applicable only to the initial frame and which are applicable to the sub-sequent frames. | Clarify that the bandwidth change is applicable to all EMLMR frame exchanges but the NSS change is only applicable to the initial frame of a frame exchange with an EMLMR non-AP MLD. | Revised Discussion: the sentence at P596L55 clearly mnetions the Nss OM operation are applied to the initial frame/PPDU transmitted by the associated AP in the link. The TXOP operating rule about the BW of the OM operation of an EMLMR STA will apparently applied to all the PPDUs addressed to the STA.TGbe editor: please add the following note after the paragraph at P569L54: NOTE ---- The Channel Width (Extension) received from a EMLMR STA’s (EHT) OM Control field or Operating Mode Notification element is applied to all the PPDUs addressed to the STA.  |
| 19845 | 570 | 54 | "After the end of the frame exchange sequence, each non-AP STA affiliated with the non-AP MLD in the EMLMR mode shall be able to transmit or receive PPDU,..." | change PPDU to PPDUs | Accepted |
| 19878 | 568 | 29 | How to update the NSS in EMLMR mode is missing. | Add the details on how the EML OM is updated through OMN frame. | RejectedDiscussion: this was discussed in last round 11be comment resolution. Some people think that the current EMLMR mode negotiation doesn’t preclude the NSS change. There is no need to add additional text for it. |

9.4.1.70 EML Control field

*TGbe editor: Pleas echange “EMLSR Parameter Update Control” to “EMLSR/EMLMR Parameter Update Control” (#19571)*

*TGbe editor: Pleas echange the following two paragraphs (#19571)*

The EMLSR/EMLMR Parameter Update Control subfield indicates whether the EMLSR/EMLMR Parameter Update field is present in the EML Operating Mode Notification frame. The EMLSR/EMLMR Parameter Update Control subfield is set to 1 when the EMLSR/EMLMR Mode subfield is equal to 1 and the EMLSR/EMLMR Parameter Update field is present in the EML Operating Mode Notification frame, and set to 0 otherwise. When included in a frame sent by an AP affiliated with an AP MLD, the EMLSR/EMLMR Parameter Update Control subfield is set to 0.

NOTE 2—When the EMLSR/EMLMR Parameter Update Control subfield is set to 1, the EMLSR/EMLMR Link Bitmap subfield of the EML Control field contains a different value than the EMLSR/EMLMR Link Bitmap subfield value contained in a previous EML Operating Mode Notification frame successfully transmitted by the non-AP MLD (see 35.3.17 (Enhanced multi-link sin­gle radio operation) and 35.3.18 (Enhanced multi-link multi-radio operation)).

*TGbe editor: Pleas echange subclause 9.4.1.72 as follows (#19571)*

**9.4.1.72 EMLSR/EMLMR Parameter Update field**

The EMLSR/EMLMR Parameter Update field is defined in Figure 9-189f (EMLSR/EMLMR Parameter Update field format).

B0 B2 B3 B5 B6 B7

Bits: 3 3 2

|  |  |  |
| --- | --- | --- |
| EMLSR/EMLMR Padding Delay | EMLSR/EMLMR Transition Delay | Reserved |

**Figure 9-189f—EMLSR/EMLMR Parameter Update field format**

The EMLSR Parameter Update field is optionally included in the EML Operating Mode Notification frame, and the presence of this field is indicated by the EMLSR Parameter Update Control subfield of the EML Control field. The EMLSR Parameter Update field is present if, at the time of the EML Operating Mode Notification frame transmission, the non-AP MLD intends to update the EMLSR Padding Delay subfield or the EMLSR Transition Delay subfield of the non-AP MLD or both from their respective last transmitted value(s) included either in the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element in the (Re)association Request frame that the non-AP MLD transmits, or in the last successfully transmitted EML Operating Mode Notification frame; the EMLSR Parameter Update field is not present otherwise.

The EMLSR Padding Delay subfield is set as defined in Table 9-404e (Encoding of the EMLSR Padding Delay subfield).

The EMLSR Transition Delay subfield is set as defined in Table 9-404f (Encoding of the EMLSR Transi­tion Delay subfield).

The EMLMR Parameter Update field is optionally included in the EML Operating Mode Notification frame, and the presence of this field is indicated by the EMLMR Parameter Update Control subfield of the EML Control field. The EMLMR Parameter Update field is present if, at the time of the EML Operating Mode Notification frame transmission, the non-AP MLD intends to update the EMLMR Padding Delay subfield or the EMLMR Transition Delay subfield of the non-AP MLD or both from their respective last transmitted value(s) included either in the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element in the (Re)association Request frame that the non-AP MLD transmits, or in the last successfully transmitted EML Operating Mode Notification frame; the EMLMR Parameter Update field is not present otherwise.

The EMLMR Padding Delay subfield is set as defined in Table 9-404g (Encoding of the EMLMR Padding Delay subfield).

The EMLMR Transition Delay subfield is set as defined in Table 9-404h (Encoding of the EMLMR Transi­tion Delay subfield).

9.6.35.8 EML Operating Mode Notification frame details

*TGbe editor: Pleas echange Table 9-628j as follows (#19571)*

**Table 9-628j—Protected EML Operating Mode Notification frame Action field format**

|  |  |
| --- | --- |
| **Order** | **Information** |
| 1 | Category |
| 2 | Protected EHT Action |
| 3 | Dialog Token |
| 4 | EML Control (see [9.4.1.70 (EML Control field)](#_bookmark117)) |
| 5 | EMLSR/EMLMR Parameter Update (optional) (see [9.4.1.72](#_bookmark123) [(EMLSR/EMLMR Parameter Update field)](#_bookmark123)) |

*TGbe editor: Please change the last paragraph of 9.6.35.8 as follows (#19571)*

The EMLSR Parameter Update field is optionally present in the EML Operating Mode Notification frame. The EMLSR Parameter Update field is present if the EMLSR Parameter Update Control subfield of the EML Control field is equal to 1 and the EML Operating Mode Notification frame is sent by a non-AP STA affiliated with a non-AP MLD; otherwise, not present. The EMLSR Parameter Update field is defined in 9.4.1.72 (EMLSR/EMLMR Parameter Update field).

*TGbe editor: Pleas add the following paragraph at the end of 9.6.35.8 (#19571)*

The EMLMR Parameter Update field is optionally present in the EML Operating Mode Notification frame. The EMLMR Parameter Update field is present if the EMLMR Parameter Update Control subfield of the EML Control field is equal to 1 and the EML Operating Mode Notification frame is sent by a non-AP STA affiliated with a non-AP MLD; otherwise, not present. The EMLMR Parameter Update field is defined in 9.4.1.72 (EMLSR/EMLMR Parameter Update field).

**35.3.18 Enhanced multi-link multi-radio operation**

*TGbe editor: Please change subclause 35.3.18 as follows (#19571)*

……A non-AP MLD with dot11EHTEMLMROptionActivated equal to true shall indicate the minimum padding duration required for the non-AP MLD for EMLMR link switch in the EMLMR Padding Delay subfield in the Common Info field of transmitted Basic Multi-Link elements. Additionally the non-AP MLD may update the EMLMR padding delay by including an updated EMLMR pad­ding delay duration in the EMLMR Parameter Update field in the EML Operating Mode Notifi­cation frame.

NOTE 1—EMLMR link switching, which is the action of switching transmit chains and receive chains from one link to another link, can happen during the transmission time of the initial response frame. However, the duration of the initial response frame can be different depending on the initial frame. The non-AP MLD might determine the minimum padding duration such that it can be satisfied even when the shortest initial response frame is used on EMLMR link(s) (e.g., a CTS frame in non-HT PPDU with the highest rate in the BSSBasicRateSet parameters).

When an AP affiliated with an AP MLD transmits a PPDU that initiates a frame exchange with a non-AP MLD operating in EMLMR mode, the AP shall ensure that the padding duration of the PPDU is longer than or equal to the minimum padding duration value indicated by the EMLMR Padding Delay field of the Basic Multi-Link element in the (Re)Association Request frame received from the non-AP MLD or in the EMLMR Padding Delay subfield of the EMLMR Parameter Update field in the last success­fully transmitted EML Operating Mode Notification frame.

NOTE 2—The initial frame exchange can be any frame exchange as long as the soliciting frame satisfies the padding requirement, e.g., through Trigger frame padding if the soliciting frame is a Trigger frame, or through MPDU delimiter padding if the soliciting frame is carried in an A-MPDU.

A non-AP MLD with dot11EHTEMLMROptionActivated equal to true shall indicate its EMLMR transition delay in the EMLMR Transition Delay subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element carried in a (Re)Association Request frame that it transmits. The non-AP MLD may update its EMLMR transition delay by including the EMLMR Parameter Update field in an EML Operating Mode Notification frame.

When the EMLMR Parameter Update field is present in an EML Operating Mode Notification frame transmitted by a non-AP MLD with dot11EHTEMLMROptionActivated equal to true, the EMLMR Link Bitmap subfield of the EML Control field shall contain a different value than the EMLMR Link Bitmap value contained in the most recent EML Operating Mode Notification frame successfully transmitted by the non-AP MLD.

Within a TXOP initiated by an AP affiliated with AP MLD with an EMLMR STA affiliated with a non-AP MLD as the TXOP responder, the non-AP MLD shall switch to its per-link spatial stream capabilities defined by the EHT Capabilities element or the current operating mode (if different from the EHT Capabilities element) per (EHT) OM Control or Operating Mode Notification element after the time indicated in the EMLMR Transition Delay subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element or in the EMLMR Padding Delay subfield of the EMLMR Parameter Update field in the last success­fully transmitted EML Operating Mode Notification frame if any of the following conditions is met and this is defined as the end of the frame exchange sequence:

……

**35.5.2.2.3 Padding for a triggering frame**

*TGbe editor: Please change subclause 35.5.2.2.3 as follows (#19571)*

**……**

When an EHT AP of an AP MLD transmits a triggering frame in a non-HT or non-HT duplicate PPDU as an initial frame to initiate a frame exchange with a non-AP MLD operating in EMLMR mode, the AP shall ensure that the number of bits in the PSDU following the last bit of the User Info field addressed to the non-

AP MLD is at least *LPAD* *MAC* defined in [Equation (35-1)](#_bookmark86) together with the padding requirement defined in

26.5.2.2.3 (Padding for a triggering frame)

*LPAD* *MAC*

= *NDBPSmPAD*

(35-2)

where

0

if *EMLMR*\_*PADDING*\_*DELAY* is 0

*mPAD* =



2*EMLMR*\_*PADDING*\_*DELAY* + 2

Otherwise

*EMLMR*\_*PADDING*\_*DELAY* is the value of the EMLMR Padding Delay subfield in the EML Capabilities subfield in the Multi-Link element, or an updated EMLMR Padding Delay included in the EMLMR Parameter Update field of an EML Operating Mode Notification frame.

*NDBPS* is defined in Table 17-4 (Modulation-dependent parameters).

……