IEEE P802.11
Wireless LANs

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| CR for CIDs related to EMLSR  |
| Date: October 29, 2021 |
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 Abstract

This submission proposes resolutions for 20 CIDs received for TGbe CC36:

SP: Do you agree to the resolutions provided in doc 11-21/1702r2 for the following CIDs for inclusion in the latest 11be draft?

6777, 6938, 8354, 5931, 6964, 5058, 5930, 6741, 8352, 8047, 6658, 5673, 5385, 6100, 7611

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Added a NOTE based on offline feedback
* Rev 2: Changes during TGbe MAC call on 11/04/2021

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** | **Section** | **Pg.Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 6777 | Romain GUIGNARD | 35.3.15 | 281.17 | In this subclause,only the AP MLD is the initiator of the initial Control Frame. What is the behaviour of a non-AP MLD in EMLSR mode to iniate transmission? | Please specify the behaviour of an EMLSR in case of transmission. | **Revised** The normative behavior for non-AP MLD when it initiates a frame exchange sequence with the AP MLD is added. A note is added to clarify that the non-AP MLD does not need to transmit an initial Control frame to initiate frame exchanges with the AP MLD.**TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #6777** |
| 6938 | Saju Palayur |   | 0.00 | What is the mechanism for EMLSR to initiate transmission? EMLSR station is currently cannot switch to one link by itself and transmit the AP a PPDU. This action will prevent from the STA to receive low MCS frames on both links. | Add normative that allow EMLSR to initiate data transmission. Solution also requires to avoid the race condition between the two links where both EMLSR STA and MLD AP are trying to send each other frames on two links in parallel | **Revised** The normative behavior for non-AP MLD when it initiates a frame exchange sequence with the non-AP MLD is added. A note is added to clarify that the non-AP MLD does not need to transmit an initial Control frame to initiate frame exchanges with the AP MLD.**TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #6777** |
| 8354 | Zhiqiang Han | 35.3.15 | 281.30 | The paragraph describes how a non-AP MLD linstens on the enabled links in the EMLSR mode. But how a non-AP MLD initiates a transmission is not clear in the EMLSR mode.In | Please clarify it | **Revised** The normative behavior for non-AP MLD when it initiates a frame exchange sequence with the non-AP MLD is added. A note is added to clarify that the non-AP MLD does not need to transmit an initial Control frame to initiate frame exchanges with the AP MLD.**TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #6777** |
| 7336 | stephane baron | 35.3.15 | 281.31 | Please clarify that non-AP MLD operating in EMLSR mode shal only transmit data after a successful initial frame exchange initiated by the AP-MLD. | please add a sub bullet in the list : "- a non-AP MLD shall not transmit or receive on any link before a successful initial frame exchange and shall not transmit or receive on any link after the end of the frame exchange sequence." | **Revised** Since the current spec allows CCA during the listening operation on the enabled links, the affiliated STAs can also transmit and initiate a frame exchange sequence on those links. The normative behavior for non-AP MLD when it initiates a frame exchange sequence with the non-AP MLD is added.**TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #6777** |
| 6325 | Ming Gan | 35.3.15 | 281.44 | "The delay time duration" is not clear, when does it start? After the initial control frame or after the response frame to initial control frame? | as in the comment | **Revised**The ‘delay time duration’ was revised to ‘minimum padding duration’ and the purpose of the value carried in the EMLSR Delay subfield is clarified. With the added statements, it becomes clear that the duration is applied to fill the Padding field of the initial Control frame.**TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #6325** |
| 7334 | stephane baron | 35.3.15 | 281.43 | EMLSR "delay time duration" is not defined nor used later on. | Please replace "delay time duration" by "padding duration required for the non-AP MLD for EMLSR link switch". | **Revised**Agree with the comment. The ‘delay time duration’ was revised to ‘minimum padding duration’ and the purpose of the value carried in the EMLSR Delay subfield is clarified. **TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #6325** |
| 5931 | Li-Hsiang Sun | 35.3.15 | 281.38 | EMLMR uses an initial frame in UL for siwtching delay. Whether this is needed for EMLSR? | aligning the UL behavior with EMLMR | **Rejected.**The EMLSR operation doesn’t need the initial Control frame for uplink transmission by a STA affiliated with the non-AP MLD. As resolution for CID 6777, a Note is added to indicate that no initial Control frame is required for UL transmissions in EMLSR. |
| 4422 | Arik Klein | 35.3.15 | 281.44 | The AP expected normative behaviour to the EMLSR delay time indication is not clear: the non-AP MLD is required to "indicate the delay time duration in the EMLSRDelay subfield of the EML Capabilities subfield in the Common Info field of the Basic variant MultiLink element". It is not clear what the AP MLD is required to do with this information | Please add a requirement for the AP MLD to send the initiating control frame with padding duration as indicated by the non-AP MLD on any link that the initiating control frame is transmitted. | **Revised**The normative behavior of the AP when initiating the frame exchange sequence is described. The AP uses the duration indicated in the EML Capabilities field for setting the length of the Padding field in the initial Control frame.  **TGbe editor: Please implement the changes shown in doc 11-21/1702r2 tagged as #4422** |
| 8049 | Yuchen Guo | 35.3.15 | 281.44 | The non-AP MLD may need different delay time durations after receiving the initial control frame of MU-RTS or the BSRP, because the control response frames are non-HT (duplicate) PPDU and TB PPDU, respectively. | non-AP MLD can indicate two padding durations, one for MU-RTS, the other for BSRP. | **Rejected**The non-AP can signal the larger of the two durations in the EMLSR Delay subfield.  |
| 6964 | Sanghyun Kim | 9.4.2.295b.2 | 131.23 | What is the padding length of an initial control frame(e.g., BSRP Trigger frame) that addressed to more than one STAs of EMLSR MLDs, when the STAs has different value in the EMLSR Delay subfield each other? | Clarify it | **Revised**A note is added to clarify that when the AP affiliated with the AP MLD transmits an MU-RTS or BSRP Trigger Frame that initiates a frame exchange sequence with more than one non-AP MLD operating in the EMLSR mode, the AP ensures that Padding duration of the initial Control frame is greater than the maximum of the values indicated in the EMLSR Delay field of the Basic Multi-Link element received from the non-AP MLDs.**TGbe editor: Please implement the changes shown in document 11-21/1702r2 tagged as #6964** |
| 5058 | Gaurang Naik | 35.3.15 | 281.23 | It is not clear if the EML Capabilities Present subfield is set to 1 for all frames carrying the Multi-Link element transmitted by an MLD that has dot11EHTEMLSROptionImplemented set to true, or is set to 1 in only some frames carrying the Multi-Link element. This must be specified. | As in comment | **Revised**Agree with the comment. It is clarified that the EML Capabilities subfield is present in all Management frames that include the Basic Multi-Link element, except Authentication frames. **TGbe editor: please implement the changes shown in document 11-21/1702r2 tagged as #5058.** |
| 5930 | Li-Hsiang Sun | 35.3.15 | 281.23 | "An MLD with dot11EHTEMLSROptionImplemented equal to true shall set the EMLCapabilities Present subfield to 1 and shall set the EMLSR Support subfield of the Common Info field of theBasic variant Multi-Link element (9.4.2.295b.2 (Basic variant Multi-Link element)) to 1"this is not necessary for authetication frame | add exception | **Revised**Agree with the comment. It is clarified that the EML Capabilities subfield is present in all Management frames that include the Basic Multi-Link element, except Authentication frames. **TGbe editor: please implement the changes shown in document 11-21/1702r2 tagged as #5058.** |
| 6741 | Rojan Chitrakar | 35.3.15 | 281.23 | From this paragraph, it would appear that the EML Capabilities field is always present in the Basic variant MLE regardless of the value of the MIB variable (dot11EHTEMLSROptionImplemented) since the EMLSR Support subfield needs to be set in both cases. If that is indeed the intention, the text can be rephrased better. | In the otherwise section, add text that the EML Capabilities Present subfield is still set to 1. | **Revised**Agree with the comment. It is clarified that if the MIB variable is false, then depending on EMLMR support, the EML Capabilities may be set to 1. Such an MLD will set the EMLSR Support subfield to 0.**TGbe editor: please implement the changes shown in document 11-21/1702r2 tagged as #6741** |
| 8352 | Zhiqiang Han | 35.3.15 | 281.27 | If dot11EHTEMLSROptionImplemented equal to false and other condition (dot11EHTEMLMROptionImplemented) is met, the EML Capablities Present subfield will be set to 0 and EMLSR Support subfield is not present.So in the otherwise, there are two cases: set the EMLSR Support subfield to 0 or not this field is not present | Please clarify it | **Revised**Agree with the comment. It is clarified that if the MIB variable is false, then depending on EMLMR support, the EML Capabilities Present subfield may be set to 1. Such an MLD will set the EMLSR Support subfield to 0.**TGbe editor: please implement the changes shown in document 11-21/1702r2 tagged as #6741** |
| 8047 | Yuchen Guo | 35.3.15 | 281.29 | Add "," before "the" | as in comment | **Accepted** |
| 6658 | Qi Wang | 35.3.15 | 281.55 | "After receiving the initial Control frame of a frame exchange sequence, the non-AP MLD shall be able to transmit or receive frames on the link in which the initial Control frame was received and shall not transmit or receive on the other link(s) until the end of the frame exchange sequence, and subject to its spatial stream capabilities, operation mode, and link switch delay, the non-AP MLD shall be capable of receiving a PPDU that is sent using more than one spatial stream a SIFS after the end of its response frame transmission solicited by the initial Control frame. " For the last part of this long sentence, please clarify on which link the non-AP MLD shall be capable of receiving a PPDU that is sent using more than one spatial stream a SIFS after the end of its response frame transmission solicited by the initial Control frame. | Revised the text to: ""After receiving the initial Control frame of a frame exchange sequence, the non-AP MLD shall be able to transmit or receive frames on the link in which the initial Control frame was received and shall not transmit or receive on the other link(s) until the end of the frame exchange sequence, and subject to its spatial stream capabilities, operation mode, and link switch delay, the non-AP MLD shall be capable of receiving a PPDU that is sent using more than one spatial stream on the link in which the initial Control frame was received a SIFS after the end of its response frame transmission solicited by the initial Control frame. " | **Accepted** |
| 5673 | Julien Sevin | 35,3,15 | 282.03 | Change "ELMSR" by "EMLSR" | As in comment | **Accepted** |
| 5385 | Jay Yang | 35.3.15 | 282.05 | typo issue, ELMSR shall be EMLSR | ELMSR shall be EMLSR | **Accepted** |
| 6100 | Marcos Martinez Vazquez | 35.5.15 | 282.05 | In the sentence "not operating in the ELMSR mode is shown" there is a type | Change ELMSR to EMLSR | **Accepted** |
| 7611 | Tomoko Adachi | 35.3.15 | 282.05 | "... not operating in the ELMSR mode ..." It should be "... not operating in the EMLSR mode ...". | As in comment. | **Accepted** |

***TGbe editor: Please note Baseline is 11be D1.******2***

**35.3.16 Enhanced multi-link single radio operation**

An MLD with dot11EHTEMLSROptionImplemented equal to true shall set the EML Capabilities Present subfield to 1 and shall set the EMLSR Support subfield of the Common Info field of the Basic Multi-Link element (9.4.2.295b.2 (Basic Multi-Link element)) to 1 in all Management frames that include the Basic Multi-Link element except Authentication frames (#5058). (#6741)An MLD with dot11EHTEMLSROptionImplemented equal to false and dot11EHTEMLMROptionImplemented equal to true (see 35.3.17 (Enhanced multi-link multi radio operations)) shall set the EML Capabilities Present subfield to 1 and shall set the EMLSR Support subfield of the EML Capabilities subfield to 0. (#6741)An MLD with dot11EHTEMLSROptionImplemented equal to false and dot11EHTEMLMROptionImplemented equal to false shall set the EML Capabilities Present subfield to 0.

When a non-AP MLD is operating in the EMLSR mode with an AP MLD supporting the EMLSR mode, the following applies:

…

* The non-AP MLD shall indicate the minimum padding duration required for the non-AP MLD to switch from the listening operation to receiving a PPDU after the initial Control frame, without the limitations applied for the initial Control frame (#6325), in the EMLSR Delay subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element. The AP MLD shall ensure that the padding duration of the Padding field of the initial Control frame is longer than or equal to the minimum padding duration value indicated by the EMLSR Padding Delay subfield of the Basic Multi-Link element received from a STA affiliated with the non-AP MLD (#4422).

…

* Only one STA affiliated with the non-AP MLD that is operating on one of the EMLSR links may initiate frame exchanges with the AP MLD (#6777).
	+ NOTE – A STA affiliated with a non-AP MLD operating in the EMLSR mode does not need to transmit an initial Control frame to initiate frame exchanges with the AP MLD (#6777)

NOTE 1—A sounding sequence also follows the rules above.

NOTE 2 – When an AP affiliated with the AP MLD transmits an initial Control frame that initiates frame exchanges with more than one non-AP MLD operating in the EMLSR mode, the AP ensures that the padding duration of the Padding field of the initial Control frame is greater than or equal to the maximum of the values indicated in the EMLSR Padding Delay subfield of the Basic Multi-Link element received from the non-AP MLDs with which the frame exchanges are initiated. (#6964)