IEEE P802.11  
Wireless LANs

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| LB271 Comment Resolution Clause 35 EMLSR  (Part 3) | | | | |
| Date: 2023-4-17 | | | | |
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Abstract

This submission proposes comment resolution(s) for the following 27 CID(s) received in LB271 on TGbe D3.0 related to 35.3.17 EMLSR Operation (part 3):

CIDs:

15016 15082 15081 16928 16625 17868 17869 16689 17867 15005

17250 17251 15058 16097 16677 15417 15449 15703 15450 15593

15110 18264 15646 15229 15729 17883 15913

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: updated to D3.2 text
* Rev 2: adding green tags and updates per TGbe chair’s suggestions
* Rev 3: revised resolutions for CIDs 15016, 16625, 17868, 17869, ready for SP.
  + Remaining CIDs for review: 15593 15110 18264 15646 15229 15729 17883 15913

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| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | | **Resolution** |
| 15016 | Matthew Fischer | 35.3.17 | 565.12 | The eMLSR switch to listening operation language is a bit vague and leaves out a few details. | | Revised.  Agree in principle.  TGbe editor to make the changes with the CID tag (#15016) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| **Proposed Change** | | | | | |
| Change:  *The non-AP MLD shall be switched back to the listening operation on the EMLSR links*  *after the EMLSR transition delay time last indicated by the non-AP MLD either in*  *the EMLSR Transition Delay subfield of the EML Capabilities subfield in the Common*  *Info field of the Basic Multi-Link element or in the EMLSR Transition Delay subfield*  *of the EMLSR 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 exchanges*:  To  The non-AP MLD shall initiate a switch to listening operation on the EMLSR links  upon detection of any of the following conditions:  Change  *The non-AP MLD shall be switched back to the listening operation on the EMLSR links*  *after the time duration indicated in the EMLSR Transition Delay subfield after the end of the TXOP.*  To  The non-AP MLD shall initiate a switch to listening operation on the EMLSR links  immediately after the end of the TXOP.  Add the following text after the last bullet item, as new bullets:  - The AP affiliated with the AP MLD should not transmit any frame to the non-AP MLD on the EMLSR  links until after the advertised EMLSR transition delay time of the non-AP MLD has passed,  as measured from the detection of the condition that initiated the switch.  - The non-AP MLD shall complete an initiated switch back to listening operation on the EMLSR links  not later than the EMLSR transition delay time last indicated by the non-AP MLD either in  the EMLSR Transition Delay subfield of the EML Capabilities subfield in the Common  Info field of the Basic Multi-Link element or in the EMLSR Transition Delay subfield  of the EMLSR Parameter Update field in the last successfully transmitted EML Operating  Mode Notification frame, as measured from the detection of the condition that initiated the switch. | | | | | |
| 15082 | Minyoung Park | 35.3.17 | 567.02 | Replace "after the time duration indicated in the EMLSR Transition Delay subfield" to "after the EMLSR transition delay" since the EMLSR transition delay is defined in the previous sub-bullet in P566L1. | As in the comment. | Revised.  Agree in principle.  TGbe editor to make the changes with the CID tag (#15082) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 15081 | Minyoung Park | 35.3.17 | 566.12 | In the following sentence, the part starting from "either in the EMLSR ..." until "if" seems to be redundant since the definition of the EMLSR transition delay is defined in the previous sub-bullet and this addition makes the sentence hard to read: "*The non-AP MLD shall be switched back to the listening operation on the EMLSR links after the EMLSR transition delay time last indicated by the non-AP MLD either in the EMLSR Transition Delay subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element or in the EMLSR Transition Delay subfield of the EMLSR 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 exchanges*:" | Remove the commented part from the sentence and rephrase it as follows: "The non-AP MLD shall be switched back to the listening operation on the EMLSR links after the EMLSR transition delay time last indicated by the non-AP MLD, if any of the following conditions is met and this is defined as the end of the frame exchanges:" | Revised.  Agree in principle.  TGbe editor to make the changes with the CID tag (#15081) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 16928 | Mark RISON | 35.3.17 | 566.12 | "The non-AP MLD shall be switched back" should be active | Change to "The non-AP MLD shall switch back". Ditto at 567.1 | Rejected.  The sentence is defining the normative behavior of a non-AP MLD when it is in the listening operation. |
| 16625 | Sindhu Verma | 35.3.17 | 567.01 | In the text "*The non-AP MLD shall be switched back to the listening operation on the EMLSR links after the time duration indicated in the EMLSR Transition Delay subfield after the end of the TXOP.*" , the implication is that the non-AP MLD shall be available in listening operation on the EMLSR links not later than after the EMLSR transition delay from the end of the burst. However, the language can be misleading and can seem to suggest that the switching to listening operation starts only after the EMLSR transition delay. This needs to be corrected. | Suggest to change the text to ""The non-AP MLD shall be switched back to the listening operation on the EMLSR links not later than the time duration indicated in the EMLSR Transition Delay subfield after the end of the TXOP" | Revised.  Agree in principle.  TGbe editor to make the changes with the CID tag (#15016) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 17868 | Gaurang Naik | 35.3.17 | 566.12 | It is not clear how long after the transition delay ends the non-AP MLD starts the listening operation. Clarify the text for non-AP MLD stating that it starts the listening operation at the expiration of the EMLSR transition delay so that expectation from both AP and non-AP MLD are in sync. | As in comment | Revised.  The sentence is clarified that a non-AP MLD is in the listening operation not later than the EMLSR transition delay time. The intention of the text was to have a non-AP MLD to complete switching to the listening operation on the EMLSR links no later than the EMLSR transition delay time announced by the non-AP MLD.  TGbe editor to make the changes with the CID tag (#15016) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 17869 | Gaurang Naik | 35.3.17 | 567.01 | It is not clear how long after the transition delay ends the non-AP MLD starts the listening operation. Clarify the text for non-AP MLD stating that it starts the listening operation at the expiration of the EMLSR transition delay so that expectation from both AP and non-AP MLD are in sync. | As in comment | Revised.  The sentence is clarified that a non-AP MLD is in the listening operation not later than the EMLSR transition delay time. The intention of the text was to have a non-AP MLD to complete switching to the listening operation on the EMLSR links no later than the EMLSR transition delay time announced by the non-AP MLD.  TGbe editor to make the changes with the CID tag (#15016) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 16689 | Qi Wang | 35.3.17 | 566.20 | The TXOP continuation rule, i.e. a preamble reception after a PIFS from the EMLSR TXOP has unclear duration. The duration depends on the received PPDU type. | Please allow AP to control more precisely the duration before the STA returns to obtain ICF on EMLSR links. | Revised.  When there is no frame received after SIFS+aSlotTime, a non-AP STA just needs to wait for the minimum of aRxPHYStartDelay values, which is 20 usec.  TGbe editor to make the changes with the CID tag (#16689) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |

**TGbe Editor to make the following changes in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D3.2(pre-release-0401) P578-579 based on the motioned text in doc.11-23/437r3:**

d) After receiving the initial Control frame of frame exchanges and transmitting an immediate response frame as a response to the initial Control frame, a non-AP STA affiliated with the non-AP MLD that was listening on the corresponding link shall be able to transmit or receive frames on the link on which the initial Control frame was received and shall not transmit or receive on the other EMLSR link(s) until the end of the frame exchanges, and subject to its spatial stream capabilities, operation mode, and the minimum MAC padding duration of the Padding field of the initial Control frame, the non-AP STA affiliated with the non-AP MLD shall be capable of receiving a PPDU that is sent using more than one spatial stream on the link on which the initial Control frame was received a SIFS after the end of its response frame transmission solicited by the initial Control frame. During the frame exchanges, the other AP(s) affiliated with the AP MLD shall not transmit frames to the other non-AP STA(s) affiliated with the non-AP MLD on the other EMLSR link(s).

e) The non-AP MLD shall indicate its (#16926)EMLSR transition delay in the EMLSR 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 EMLSR transition delay by including the EMLSR Parameter Update field in an EML Operating Mode Notification frame.

f) When the EMLSR Parameter Update field is present in an EML Operating Mode Notification frame, the EMLSR Link Bitmap subfield of the EML Control field shall contain a different value than the EMLSR Link Bitmap value contained in (#16927)the most recent EML Operating Mode Notification frame successfully transmitted by the non-AP MLD.

g) The non-AP MLD shall be (#15016)in the listening operation on the EMLSR links (#15016)immediately after the EMLSR transition delay time most recently indicated by the non-AP MLD(#15081) (#15016)starting from the detection of any of the following conditions, and this is defined as the end of the frame exchanges:

• The MAC of the non-AP STA affiliated with the non-AP MLD that received the initial Control frame does not receive a PHY-RXSTART.indication primitive during a timeout interval of aSIFSTime + aSlotTime + aRxPHYStartDelay(#16689), where aRxPHYStartDelay is equal to 20 µsec, starting at the end of the PPDU transmitted by the non-AP STA affiliated with the non-AP MLD as a response to the most recently received frame from the AP affiliated with the AP MLD or starting at the end of the reception of the PPDU containing a frame for the non-AP STA from the AP affiliated with the AP MLD that does not require immediate acknowledgement.

…

j) When a non-AP STA affiliated with the non-AP MLD initiates a TXOP, the following applies:

• The non-AP MLD shall be (#15016)in the listening operation on the EMLSR links (#15016)immediately after the (#15082)EMLSR transition delay time most recently indicated by the non-AP MLD(#15016) starting from the end of the TXOP.

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| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 17867 | Gaurang Naik | 35.3.17 | 566.12 | If AP or non-AP STA's backoff counter expires during the EMLSR transition delay, it must select a new backoff counter.Otherwise, if the STAs whose backoff counter reached 0 keep their backoff counter at 0 until the end of the EMLSR transition delay, multiple STAs can initiate transmissions immediately following the EMLSR transition delay causing collisions. | Specify that if an AP or non-AP STA's backoff counter reaches 0 during EMLSR transition delay, the STA picks a new backoff counter. | Revised.  Agree with the commenter.  TGbe editor to make the changes with the CID tag (#17867) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 15005 | Matthew Fischer | 35.3.17 | 567.06 | Additional clarification is needed regarding eMLSR non-AP STA behavior | In the cited location within 35.3.17, add the following:  While a frame exchanges is occurring on one link of a non-AP MLD operating in EMLSR mode, the EDCAFs operating on other link(s) of the MLD may perform EDCAF backoff. If any such EDCF gains the right to initiate transmission the corresponding STA shall not initiate the transmission of a frame of the corresponding AC if there is a non-zero value in the transition delay timer on the link on which the frame exchange is occurring. In such a case, the STA shall invoke a backoff for the EDCAF associated with that AC as allowed per item i) of 10.23.2.2 (EDCA backoff procedure).  And to 10.23.2.2, add a new item \*) to be inserted between items h) and i), appropriately modifying the following list item numbering  \*) If explicitly indicated as in 35.3.17 (Enhanced multi-link single radio operation)  And also in 10.23.2.2, add the new item number to the list of item numbers found in the following sentence:  If the backoff procedure is invoked for reason a) or h) above, CW[AC] and QSRC[AC] shall be left unchanged. | Revised.  Agree with the commenter.  TGbe editor to make the changes with the CID tag (#17867) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |

**TGbe Editor to add the following item l) right before NOTE 5 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D3.2(pre-release 0401) P579L58 based on the motioned text in doc.11-23/437r3:**

(#17867) l) While a frame exchange is occurring on one link between an AP MLD and a non-AP MLD operating in EMLSR mode, the EDCAFs operating on other link(s) between the AP MLD and the non-AP MLD may perform EDCAF backoff. If any such EDCF gains the right to initiate transmission the corresponding AP or non-AP STA shall not initiate the transmission of a frame of the corresponding AC if there is a non-zero value in the EMLSR transition delay timer on the link on which the frame exchange is occurring. In such a case, the AP or the non-AP STA shall invoke a backoff for the EDCAF associated with that AC as allowed per item i) of 10.23.2.2 (EDCA backoff procedure).

**10.23 HCF**

**10.23.2 HCF contention based channel access (EDCA)**

**10.23.2.2 EDCA backoff procedure**

**…**

**TGbe Editor to insert a new item after item h) in Subclause 10.23.2.2 (EDCA backoff procedure) in TGbe D3.1 as follows and update the list numbering as following:** (#17867)

g) If explicitly indicated, such as in 26.17.2.3.3 (Non-AP STA scanning behavior).

h) If explicitly indicated as in 35.3.16.4 (Nonsimultaneous transmit and receive (NSTR) operation).

(#17867) i) If explicitly indicated as in 35.3.17 (Enhanced multi-link single radio operation)

In addition, the backoff procedure may be invoked by an EDCAF if:

j) For the EDCAF that is the TXOP holder, the transmission by the TXOP holder of an MPDU in a

non-initial PPDU of a TXOP fails, as defined in this subclause, and an MPDU in the non-initial

PPDU does not solicit an HE TB PPDU.

k) The transmission by the TXOP holder of all MPDUSMPDUs in a non-initial PPDU of a TXOP fails,

as defined in this subclause, and the PPDU contains an MPDU that solicits an HE TB PPDU.

NOTE 1—If the transmission by the TXOP holder of an MPDU in a non-initial PPDU of a TXOP failed, the STA can perform either a PIFS recovery, as described in n (Transmit a punctured non-HT duplicate PPDU if all of the 20 MHz subchannels that are not punctured were idle during an interval of PIFS immediately preceding the start of the TXOP.), perform a backoff as described in item ~~e)~~j) above, or wait for the TXNAV timer to expire and invoke the backoff procedure per item b) above. How it chooses among these options is implementation dependent.

A STA that performs a backoff within its existing TXOP per item ~~e)~~j) above shall not extend the TXNAV timer value (see n (Transmit a punctured non-HT duplicate PPDU if all of the 20 MHz subchannels that are not punctured were idle during an interval of PIFS immediately preceding the start of the TXOP.)).

NOTE 2—In other words, the backoff is a continuation of the TXOP, not the start of a new TXOP.

(#17867)If the backoff procedure is invoked for reason a) or i) above, CW[AC] and QSRC[AC] shall be left unchanged.

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| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 17250 | Mahmoud Kamel | 35.3.17 | 569.34 | It is not specified if the One or more sequences of BFRP trigger should include different STAs in each sequence as illustrated in Figure 35-47 | Edit Figure 35-34 to follow the same rules as in Figure 35-47 and edit the corresponding text accordingly. | Revised.  Agree with the commenter.  TGbe editor to make the changes with the CID tag (#17250) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |
| 17251 | Mahmoud Kamel | 35.3.17 | 569.56 | It is not specified if the One or more sequences of BFRP trigger should include different STAs in each sequence as illustrated in Figure 35-47 | Edit Figure 35-35 to follow the same rules as in Figure 35-47 and edit the corresponding text accordingly. | Revised.  Agree with the commenter.  TGbe editor to make the changes with the CID tag (#17251) in doc.: IEEE 802.11-23/0572r3  [https://mentor.ieee.org/802.11/dcn/22/11-23-0572-03-00be-lb271-cr-cl35-emlsr-part3.docx] |

**TGbe Editor to replace Figure 35-33 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D3.1 with the following figure: (#17250)**



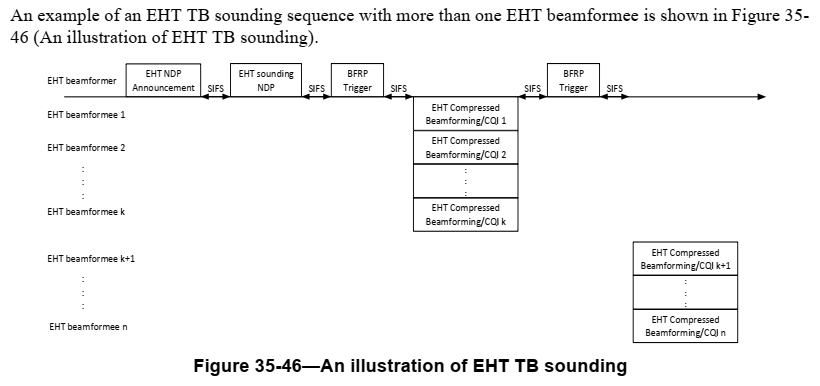
**Figure 35-33—An example of EHT TB sounding in the EMLSR operation (beamformee 1 is in the EMLSR mode, the other beamformees are not in the EMLSR mode) and the sounding sequence starts with the MU-RTS Trigger frame as the initial Control frame**

**TGbe Editor to replace Figure 35-34 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D3.1 with the following figure: (#17251)**



**Figure 35-34—An example of EHT TB sounding in the EMLSR operation (at least one beamformee from 1 to k is in the EMLSR mode, the other beamformees are not in the EMLSR mode) and the sounding sequence starts with the BSRP Trigger frame as the initial Control frame (#17251)**

*The figure 35-46 in subclause 35.7.3 (Rules for EHT sounding protocol sequences) in TGbe D3.0:*



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| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 15058 | Michail Koundourakis | 35.3.17 | 0.00 | if the non-AP STA operating in EMLSR mode has only a single link in PM=0, then the EMLSR Transition Delay shall not be applied (i.e. the AP shall not expect it). In such way, the AP and the STA will fairly compete for the TXOP after the UL TXOP finishes. With the current text, the AP shall wait for EMLSR Transition delay before it can transmit to the STA, but the non-AP STA does not have to wait before it starts the next TXOP. | Specify that EMLSR Transition Delay is not applicable when the non-AP MLD operating in EMLSR mode operates on a single link with PM=0 (and all other EMLSR links operate with PM=1). | Rejected.  In LB266, a similar comment (CID 12812) was received and a proposal in doc 11-22/1860r3 was discussed in the group but couldn’t reach consensus. |
| 16097 | Insun Jang | 35.3.17 | 563.41 | Generally, after multi-link setup, a link pair of a non-AP MLD is always considred as STR if it is not indicated as NSTR during multi-link setup. Meanwhile,EMLSR mode is enabled and EMLSR links are set after EML OMN frame is successfully transmited. With this relationship, it is a little bit confused of whether STR or NSTR links can be EMLSR links for which we do not have any descriptions, especially for the relationship between STR/NSTR link pair and EMLSR link set | As in the comment, the relationhip between STR/NSTR link pair and EMSLR link set should be clarified since STR/NSTR link pair is always indicated during multi-link setup | Rejected.  The current spec doesn’t have any restriction on regarding operating in EMLSR mode on STR or NSTR link pair. |
| 16677 | Qi Wang | 35.3.17 | 563.43 | Please specify that EMLSR can be operated on either STR or NSTR links and add the relevant signaling. Please differentiate the medium sync delay requirement for different EMLSR link pair characteristics. | As in comment. | Rejected.  The current spec doesn’t have any restriction on regarding operating in EMLSR mode on STR or NSTR link pair. |
| 15417 | John Wullert | 35.3.17 | 563.43 | The description of EMLSR does not make clear how this feature would be used. Clarifying the operation of the feature will make it easier to understand the elements that make it up. | Add a description of possible operation of EMLSR at the end of the paragaph, such as "For example, in EMLSR operation over two links, an MLD might have a single radio that switches to the active link as needed. Alternatively, the MLD might have two radios where one radio may be a lower cost radio with lesser capabilities and the other radio may be a fully functional radio. The lower cost radio is used to monitor a link and when it detects a TXOP, the fully functional radio switches to that link to perform frame exchanges." | Rejected.  It is up to an implementer how to utilize the EMLSR mode and a high-level description of the EMLSR operation is described in the first paragraph of the subclause 35.3.17. |
| 15449 | Julien Sevin | 35.3.17 | 564.20 | An AP MLD has not the possibility to propose to a non-AP MLD to initiate the EMLSR mode | Specify a procedure allowing an AP to transmit an EML Operating Mode Notification frame for proposing to a non-AP STA to initiate its EMLSR mode. | Rejected.  In LB266, CID 10157 with the same comment was discussed with the following resolution:  “*Rejected.*  *It is not clear from the comment why an AP MLD needs to force a non-AP MLD to enable/disable the EMLSR mode. It is a non-AP MLD’s choice whether to enable or disable the EMLSR mode.*”  However, the group could not reach consensus on a proposed change that would resolve the comment |
| 15703 | Yousi Lin | 35.3.17 | 564.20 | Allow AP MLD to recommend non-AP MLD to enable EMLSR/EMLMR mode. It is beneficial for AP MLD to manage the network load. | as in comment | Rejected.  In LB266, CID 14077 with a similar comment was discussed and the resolution was:  “*REJECTED*  *The task group discussed the comment but couldn’t reach consensus whether there is benefit to have an AP MLD to transmit an EML OMN frame to a non-AP MLD to enable or disable EMLSR mode.*” |
| 15450 | Julien Sevin | 35.3.17 | 564.47 | An AP MLD has not the possibility to propose to a non-AP MLD to disable the EMLSR mode | Specify a procedure allowing an AP to transmit an EML Operating Mode Notification frame for proposing to a non-AP STA to disable its EMLSR mode. | Rejected.  In LB266, CID 10158 with the same comment was discussed with the following resolution:  “*Rejected.*  *It is not clear from the comment why an AP MLD needs to force a non-AP MLD to enable/disable the EMLSR mode. It is a non-AP MLD’s choice whether to enable or disable the EMLSR mode*”  However, the group could not reach consensus on a proposed change that would resolve the comment |
| 15593 | Xiangxin Gu | 35.3.17 | 564.40 | The non-AP MLD can switch to EMLSR mode immediately after receiving an EML Operating Mode Notification frame from one of the APs operating on the EMLSR links and affiliated with the AP MLD. Would a transition delay needed? | Please clarify it | Revised.  The sentence has been updated in D3.2 as follows as part of the resolution for CID 15077 and 15563, and thus entering EMLSR mode is not immediately after reception of the EML OMN frame from the AP: “Before the end of the transition timeout interval, immediately after transmitting an acknowledgement as a response to the received EML Operating Mode Notification frame from one of the APs (#16675)affiliated with the AP MLD.”  To TGbe editor: no changes needed. |
| 15110 | Xiaogang Chen | 35.3.17 | 564.42 | "Any of the other non-AP STAs operating on the corresponding EMLSR link shall not transmit a frame with the Power Management subfield set to 1 before receiving the EML Operating Mode Notification frame from one of the APs operating on the EMLSR links and affiliated with the AP MLD or before the end of the timeout interval." as long as non-AP MLD is ready to be in EMLSR mode why adding this restriction? STAs affiliated with non-AP MLD have to stay up for the whole transition time out | remove this sentence. | Rejected.  The normative behavior was added to avoid a race condition in which a non-AP MLD is asking to transition STAs operating on the other EMLSR links on which the EML OMN frame wasn’t transmitted to be in awake state after entering the EMLSR mode but a STA on the other EMLSR links is transmitting a frame with PM=1 to enter PS mode. |
| 18264 | Li-Hsiang Sun | 35.3.17 | 564.62 | "and the other non-APSTAs operating on the corresponding EMLSR links shall transition to power save mode aftter ...Transition Timeout...".  If there are aligned TWTs setup on EMLSR links when the MLD was operating in EMLSR mode, what happens to these TWTs on the links that enter doze after disabling EMLSR? Does AP expect any/all of the links being awake at next TWT? | After EMLSR mode is disabled, for the link that performs EML Operating Mode Notification frame exchange, the TWT is kept, but for other EMLSR links, the TWTs are torn down. | Rejected.  There could be several different ways to configure the operation without restricting the operation. For example, a non-AP MLD can decide which link’s TWT to keep and which link’s TWT to tear down, and after that tear down procedure is complete, the EMLSR mode can be disabled. |
| 15646 | Xiangxin Gu | 35.3.17 | 564.63 | The other non-AP STAs operating on the corresponding EMLSR links may be not in PS mode. | Other STAs shall go to their power management mode accordingly. | Rejected.  For a single-radio MLD operating in EMLSR mode, when the EMLSR mode is disabled, there could be only one STA in awake state, so the non-AP STAs operating on the EMLSR links that didn’t transmit the EML OMN frame to disabled the EMLSR mode have to transition to PS mode. |
| 15229 | Akira Kishida | 35.3.17 | 565.22 | It should be clarified whether AP MLD may or may not transmit MU-RTS frames to each link of multiple links of EMLSR. It is desirable that non-AP MLD may utilize the link that non-AP MLD received the Initial Control frame while non-AP MLD executes listening operation on multiple links for transmissions. | Propose to add explanatory notes: "An MLD may schedule for transmission of Initial Control frames via multiple links simultaneously. A non-AP STA shall respond to only one Initial Control frame when it receives more than one Initial Control frame simultaneously." | Rejected.  Transmitting multiple initial control frames on multiple EMLSR links have the following issues:   1. NAV set on multiple EMLSR links and blocking multiple links while only one link is used for actual frame exchanges. 2. The EMLSR transition delay time needs to be increased, which increases overhead, since a non-AP MLD has to decode multiple initial control frames received on the multiple EMLSR links and decide which link to use only after the last user info field in the received initial control frames is decoded. |
| 15729 | KENGO NAGATA | 35.3.17 | 565.22 | "An AP affiliated with the AP MLD that initiates frame exchanges that are not group addressed Data or Management frames with the non-AP MLD on one of the EMLSR links shall begin the frame exchanges by transmitting the initial Control frame to the non-AP MLD with the limitations specified below." Although a tipical EMLSR implementation might not be clear enough, it should be useful to allow an AP MLD operating in the EMLSR mode to transmit multiple Initial Control frames at the same time using multiple links, if possible, and a non-AP MLD to reply to one of the Initial Control frames received successfully. | If transmitting multiple Initial Control frames at the same time using multiple links would not be excluded, the following language should be added. "An AP MLD may schedule for transmission of Initial Control frames via more than one links simultaneously . An non-AP STA shall respond to only one Initial Control frames when it successfully received more than one Initial Control frames simultaneously." | Rejected.  Transmitting multiple initial control frames on multiple EMLSR links have the following issues:   1. NAV set on multiple EMLSR links and blocking multiple links while only one link is used for actual frame exchanges. 2. The EMLSR transition delay time needs to be increased, which increases overhead, since a non-AP MLD has to decode multiple initial control frames received on the multiple EMLSR links and decide which link to use only after the last user info field in the received initial control frames is decoded. |
| 17883 | Gaurang Naik | 35.3.17 | 565.63 | "During the frame exchanges, the other AP(s) affiliated with the AP MLD \*shall not\* transmit frames to the other non-AP STA(s) affiliated with the non-AP MLD on the other EMLSR link(s)." What if the AP MLD wants to send initial Control frame on both links and let the non-AP MLD decide which link to respond on? The cited rule limits the performance of the EMLSR mode. | Change "shall not" to "should not". | Rejected.  Transmitting multiple initial control frames on multiple EMLSR links have the following issues:   1. NAV set on multiple EMLSR links and blocking multiple links while only one link is used for actual frame exchanges. 2. The EMLSR transition delay time needs to be increased, which increases overhead, since a non-AP MLD has to decode multiple initial control frames received on the multiple EMLSR links and decide which link to use only after the last user info field in the received initial control frames is decoded. |
| 15913 | Zhou Lan | 35.3.17 | 566.12 | In the secion of "*The non-AP MLD shall be switched back to the listening operation on the EMLSR links after the EMLSR transition delay time last indicated by the non-AP MLD either in the EMLSR Transition Delay subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element or in the EMLSR Transition Delay subfield of the EMLSR 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 exchanges*:", it was defined the condition when a eMLSR STA while receiving data can switch back to listening mode. Per the current condition, if the AP is bursting DL MU PPDUs, the waiting time for the eMLSR STA can be up to hundreds of us. The condition here needs to revisit to to optimize the waiting time for eMLSR STAs. | Add extra condition to optimize the waiting time of eMLSR STAs | Rejected.  A time duration based approach was discussed in the group but the group decided to use the SIFS separation based rule to return to the listening operation. |