IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB266 Comment Resolution Clause 9 EMLSR | | | | |
| Date: 2022-7-13 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Minyoung Park | Intel Corporation |  |  | Minyoung.park@intel.com |
| Alfred Asterjadhi | Qualcomm Inc. |  |  |  |
| Gaurang Naik | Qualcomm Inc. |  |  |  |
| Yunbo Li | Huawei |  |  |  |
| Ming Gan | Huawei |  |  |  |
| Liwen Chu | NXP |  |  |  |

Abstract

This submission proposes comment resolution(s) for the following 19 CID(s) received in LB266 on TGbe D2.0 related to 9.4.1.74 EML Control field:

CIDs:

12774, 12775, 13049, 13458, 13747, 10154, 12406, 11381, 12861, 11897

10869, 10153, 12598, 11505, 12599, 13050, 12959, 11382, 11384

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: added 9 CIDs
* Rev 2: revised the resolution for the ten CIDs (12774, 12775, 13049, 13458, 13747, 10154, 12406, 11381, 12861, 11897) on the EML Control field format based on the feedback during the MAC call on August 1st

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 12774 | Romain GUIGNARD | 9.4.1.74 | 190.32 | In the figure 9-144i, EMLMR link bitmap size is 0 or 16 bits while the EMLSR Link Bitmap size is 16 bits. Does it mean that EMLSR Link bitmap is mandatory whatever the value of the EMLSR mode while the EMLMR Link bitmap presence is linked to the value of the EMLMR mode. | Could you please clarify the criteria (if any) of the presence of the EMLSR link bitmaps? | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#12774) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 12775 | Romain GUIGNARD | 9.4.1.74 | 190.32 | As stated in this paragraph, the EMLSR and EMLMR mode are mutually exclusive. In that case, why have two separated link bitmap while only one should be enough.By merging the two bitmap into one, we can easily save some bits. It is only few bits to save but if we may save some bits in any frame when possible we could ultimately avoid wasting bandwidth. | Could you consider to merge the two EML bitmaps into one? | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#12775) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 13049 | Huizhao Wang | 9.4.1.74 | 190.40 | Because EMLSR and EMLMR are mutually exclusive, only one Link Bitmap sub field is needed, please remove the the redundant Link Bitmap subfield | As suggested in the comment | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#13049) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 13458 | Liwen Chu | 9.4.1.74 | 190.43 | Change the bits of EMLSR Link Bitmap to "0 or 16" | As in comment | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#13458) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 13747 | Yuchen Guo | 9.4.1.74 | 190.43 | Is the EMLSR Link Bitmap subfield always present? It seems that it's not needed if the EMLSR Mode subfield is set to 0 | change 16 to 0 or 16 | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#13747) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 10154 | Julien Sevin | 9.4.1.74 | 190.48 | As an non-AP MLD may operate either in EMLSR mode or in EMLMR mode, it is useless to include the two fields EMLSR bitmap and EMLMR bitmap. | As the EML Bitmap field inherits from the EML mode support declared in EML Capabilities, use only one bitmap field referred to as EML bitmap field to indicate the EMLSR links or the EMLMR links | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#10154) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 12406 | Sebastian Max | 9.4.1.74 | 190.48 | According to the first two paragraphs the EMLSR mode and the EMLMR mode are mutually exclusive (if one is set to 1 the other one has to be 0). The EMLSR Link Bitmap shall be included in the EML Control field even if the EMLSR Mode is 0, which is not necessary. | (a) change the number of bits of the EMLSR Link Bitmap to "0 or 16" and add a sentence to page 191, line 16: "The EMLSR Link Bitmap subfield is present if the EMLSR Mode subfield is equal to 1 and is not present otherwise", or (b) define a default setting of the EMLSR Link Bitmap in the case the EMLSR Mode subfield is equal to 0, for example all 0. | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#12406) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 11381 | Gaurang Naik | 9.4.1.74 | 191.12 | EMLSR Link Bitmap subfield must not be carried when the EMLSR Mode subfield is zero. Make the EMLSR Link Bitmap subfield optional. It should be included in the EML Control field only when the EMLSR Mode subfield is set to 1. Otherwise, the bitmap should not be present. | Add the following - 'The EMLSR Link Bitmap subfield is present if the EMLSR Mode subfield is equal to 1 and is not present otherwise.' | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#11381) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 12861 | Mikael Lorgeoux | 9.4.1.74 | 191.16 | Contrary to the EMLMR link bitmap, conditions for the presence of EMLSR link bitmap is not indicated. | Add conditions for the presence of EMLSR link bitmap. | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#12861) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 11897 | Alfred Asterjadhi | 9.4.1.74 | 191.23 | Weird formatting of the EML Control field. Have one single Link Bitmap (the one that is always present) and specify that the Link Bitmap is EMLSR Link Bitmap if eMLSR mode and is EMLMR Link Bitmaps if eMLMR mode. And remove the other bitmap that is optionally present. | As in comment. | Revised.  The EMLSR Link Bitmap subfield is present when the EMLSR Mode subfield is set to 1 and not present when the EMLSR Mode subfield is set to 0.  TGbe editor to make the changes with the CID tag (#11897) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |

**9.4.1.74 EML Control field**

**TGbe Editor to make the following changes in Figure 9-144i in TGbe D2.0**

B0 B1 B2 B7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| EMLSR  Mode | EMLMR  Mode | Reserved | EMLSR/EMLMR Link Bitmap | MCS Map Count  Control | EMLMR  Supported MCS And NSS Set |

Bits: 1 1 6 0 or 16 0 or 8 variable

**Figure 9-144i—EML Control field format** **(#12774, 12775, 13049, 13458, 13747, 10154, 12406, 11381, 12861, 11897)**

**TGbe Editor to insert the following figure after Figure 9-144i in TGbe D2.0**

|  |  |  |
| --- | --- | --- |
|  | B0 B1 | B2 B7 |
|  | MCS Map  Count | Reserved |
| Bits: | 2 | 6 |

**Figure 9-144xx—MCS Map Count Control subfield format**

**TGbe Editor to insert the following paragraph before the 3rd paragraph (P191L12) and make the following changes in the 3rd paragraph (P191L12) in Subclause 9.4.1.74 (EML Control field) in TGbe D2.0:**

(#12774, 12775, 13049, 13458, 13747, 10154, 12406, 11381, 12861, 11897)When the EMLSR Mode subfield is set to 1, the EMLSR/EMLMR Link Bitmap subfield is the EMLSR Link Bitmap subfield. When the EMLMR Mode subfield is set to 1, the EMLSR/EMLMR Link Bitmap subfield is the EMLMR Link Bitmap subfield. When the EMLSR Mode subfield is set to 0 and the EMLMR Mode subfield is set to 0, the EMLSR/EMLMR Link Bitmap is not present.

The EMLSR Link Bitmap subfield indicates the subset of the enabled links that is used by the non-AP MLD  
in the EMLSR mode. The bit position *i* of the EMLSR Link Bitmap subfield corresponds to the link with the  
Link ID equal to *i* and is set to 1 to indicate that the link is used by the non-AP MLD for the EMLSR mode  
and is a member of the EMLSR links; otherwise the bit position is set to 0. (#12774, 12775, 13049, 13458, 13747, 10154, 12406, 11381, 12861, 11897)The EMLSR Link Bitmap subfield is present if the EMLSR Mode subfield is equal to 1 and is not present otherwise.

**TGbe Editor to make the following changes in the paragraph (P191L35) in Subclause 9.4.1.74 (EML Control field) in TGbe D2.0**

The EMLMR Supported MCS And NSS Set subfield indicates the combinations of MCS and number of spatial streams NSS that a non-AP MLD supports for reception and transmission during the EMLMR operation.  
The MCS Map Count subfield is set to 0, 1, or 2 if the maximum of the supported channel widths for STAs  
affiliated with the non-AP MLD operating on EMLMR links is equal to 80 MHz, 160 MHz, and 320 MHz,  
respectively, and the value 3 is reserved. Otherwise, the MCS Map Count subfield is set to 0. The MCS Map  
Count Control subfield is present if the EMLMR Mode subfield is equal to 1 and is not present otherwise.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 10869 | Yousi Lin | 9.4.1.74 | 190.45 | A non-AP MLD that is in EMLSR mode also has different per-link capabilities. And AP MLD needs to be informed about the capabilities. So EMLMR Supported MCS And NSS Set should be extended for both EMLMR and EMLSR. | as in comment | Rejected.  Each STA’s capabilities are indicated in each STA’s Per-STA Profile during the association process and when a non-AP MLD is operating in the EMLSR mode each STA’s capabilities are used. |
| 10153 | Julien Sevin | 9.4.1.74 | 190.48 | As an non-AP MLD may operate either in EMLSR mode or in EMLMR mode, it is useless to use the two fields EMLSR Mode field and EMLMR Mode to indicate the EML mode in which the non-AP MLD operates | As the single EML mode bit inherits from the EML mode support declared in EML Capabilities, use only one-bit field referred to as EML mode field to activate the EMLSR or the EMLMR mode (mutually exclusive) | Rejected.  Explicitly indicating how to parse the EML Control field is much better than implicitly indication how to parse the EML Control field to save one bit that adds complexity for parsing. |
| 12598 | Arik Klein | 9.4.1.74 | 190.48 | Use unified terminology with respect to the EMLSR mode : enabled/disabled (used in 35.3.17) vs. operated/non-operated (used in 9.4.1.74). Suggest to use the EMLSR mode is enabled/disabled and align the terminology in 9.4.1.74 accordingly, as proposed. | Revise the sentence as follows:" A non-AP MLD that supports enhanced multi-link single radio operation (see 35.3.17 (Enhanced multi-link single radio operation)) sets the EMLSR Mode subfield to 1 to indicate that the EMLSR mode is enabled for the non-AP MLD and to 0 to indicate that EMLSR mode is disabled for the non-AP MLD." | Accepted. |
| 11505 | Xiaofei Wang | 9.4.1.74 | 190.54 | The sentence "An AP MLD with dot11EHTEMLSROptionImplemented equal to true that receives an EML Operating Mode Notification frame from a STA affiliated with a non-AP MLD sets the EMLSR Mode subfield of the EML Operating Mode Notification frame that is sent in response to the value obtained from the received EML Operating Mode Notification frame." is normative behaivor and does not belong in format section. | move the cited sentence to clause 35 | Revised.  The sentence became very confusing because normative behaviors were added to the sentence (e.g., an AP MLD responding to a non-AP MLD, etc.). Since this is already defined in 35.3,17 in details, Clause 9 should just describe what the value of the EMLSR Mode should be when set by an AP MLD.    TGbe editor to make the changes with the CID tag (#11505) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 12599 | Arik Klein | 9.4.1.74 | 190.54 | Rephrase the following sentence for better clarity (first - to which value the EMLSR Mode subfield is set and then - when it is set to this value), as proposed: "An AP MLD with dot11EHTEMLSROptionImplemented equal to true that receives an EML Operating Mode Notification frame from a STA affiliated with a non-AP MLD sets the EMLSR Mode subfield of the EML Operating Mode Notification frame that is sent in response to the value obtained from the received EML Operating Mode Notification frame." | Please revise the sentence as follows: "An AP MLD with dot11EHTEMLSROptionImplemented equal to true that receives an EML Operating Mode Notification frame from a STA affiliated with a non-AP MLD sets the EMLSR Mode subfield to the value obtained from the EMLSR Mode subfield in the received EML Operating Mode Notification frame in the EML Operating Mode Notification frame that is sent in response." | Revised.  The sentence became very confusing because normative behaviors were added to the sentence (e.g., an AP MLD responding to a non-AP MLD, etc.). Since this is already defined in 35.3,17 in details, Clause 9 should just describe what the value of the EMLSR Mode should be when set by an AP MLD.    TGbe editor to make the changes with the CID tag (#12599) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 13050 | Huizhao Wang | 9.4.1.74 | 190.56 | This statement is quite confusing, please reformat this sentence to make it comprehensible about the AP MLD behavior after receiving the EML Operating Mode Notification | Please rewrite this statement | Revised.  The sentence became very confusing because normative behaviors were added to the sentence (e.g., an AP MLD responding to a non-AP MLD, etc.). Since this is already defined in 35.3,17 in details, Clause 9 should just describe what the value of the EMLSR Mode should be when set by an AP MLD.    TGbe editor to make the changes with the CID tag (#13050) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 12959 | Chunyu Hu | 9.4.1.74 | 190.57 | The sentence is not complete: "sets the MLSR Mode subfield ..." to what? | Add "to 1" to the end of "sets the EMLSR Mode subfield ..." | Revised.  The sentence became very confusing because normative behaviors were added to the sentence (e.g., an AP MLD responding to a non-AP MLD, etc.). Since this is already defined in 35.3,17 in details, Clause 9 should just describe what the value of the EMLSR Mode should be when set by an AP MLD.    TGbe editor to make the changes with the CID tag (#12959) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 11382 | Gaurang Naik | 9.4.1.74 | 191.16 | Need to specify the value carried in the EMLSR Link Bitmap subfield when the EML Control field is transmitted by an AP. | Add the following - 'An AP MLD with dot11EHTEMLSROptionImplemented equal to true that receives an EML Operating Mode Notification frame a STA affiliated with a non-AP MLD sets the EMLSR Link Bitmap subfield of the EML Operating Mode Notification frame that is sent in response to the value obtained from the received EML Operating Mode Notification frame.' after the paragraph ending on P191L16. | Revised.  Agree with the commenter.  TGbe editor to make the changes with the CID tag (#11382) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |
| 11384 | Gaurang Naik | 9.4.1.74 | 191.30 | NOTE 3 essentially is the same as NOTE 2. The two notes can be merged to describe for EMLSR and EMLMR Link bitmaps. | Remove NOTE 3 and revise NOTE 2 to cover the description for both EMLSR and EMLMR Link Bitmaps. | Revised.  Agree with the commenter.  TGbe editor to make the changes with the CID tag (#11384) in doc.: IEEE 802.11-22/1129r2  [https://mentor.ieee.org/802.11/dcn/22/11-22-1129-02-00be-lb266-cr-cl9-emlsr.docx] |

**TGbe Editor to make the following changes in the paragraph (P190L48) right after the Figure 9-144i in Subclause 9.4.1.74 (EML Control field) in TGbe D2.0:**

A non-AP MLD that supports enhanced multi-link single radio operation (see 35.3.17 (Enhanced multi-link single radio operation)) sets the EMLSR Mode subfield to 1 to indicate that (#12598)the EMLSR mode is enabled for the non-AP MLD and to 0 to indicate that (#12598)the EMLSR mode is disabled for the non-AP MLD. A non-AP MLD that does not support enhanced multi-link single radio operation (see 35.3.17 (Enhanced multi-link single radio operation)) sets the EMLSR Mode subfield to 0. The EMLSR Mode subfield is set to 0 if the EMLMR Mode subfield is set to 1. (#11505, 12599, 13050, 12959)An AP MLD with dot11EHTEMLSROptionImplemented equal to true sets the EMLSR Mode subfield to the value obtained from the EMLSR Mode subfield of the received EML Operating Mode Notification frame.

**TGbe Editor to make the following changes in the 3rd paragraph (P191L12) in Subclause 9.4.1.74 (EML Control field) in TGbe D2.0:**

The EMLSR Link Bitmap subfield indicates the subset of the enabled links that is used by the non-AP MLD in the EMLSR mode. The bit position *i* of the EMLSR Link Bitmap subfield corresponds to the link with the Link ID equal to *i* and is set to 1 to indicate that the link is used by the non-AP MLD for the EMLSR mode and is a member of the EMLSR links; otherwise the bit position is set to 0. (#11382)An AP MLD with dot11EHTEMLSROptionImplemented equal to true sets the EMLSR Link Bitmap subfield to the value obtained from the EMLSR Link Bitmap subfield of the received EML Operating Mode Notification frame.

**TGbe Editor to make the following changes in the 4th paragraph (P191L17) and delete NOTE 3 in Subclause 9.4.1.74 (EML Control field) in TGbe D2.0:**

NOTE 2—As an example, when a non-AP MLD enables three links and the first link has Link ID equal to 0, the second  
link has Link ID equal to 1, and the third link has Link ID equal to 2, and the two links with Link ID equal to 1 and Link  
ID equal to 2 are used for the EMLSR operation, the two bit positions, the second bit and the third bit positions, of the  
EMLSR Link Bitmap subfield are set to 1 and other bit positions are set to 0. (#11384)This example applies to the EMLMR operation using the EMLMR Link Bitmap subfield.

The EMLMR Link Bitmap subfield indicates the subset of the enabled links that is used by the non-AP  
MLD in the EMLMR mode. The bit position *i* of the EMLMR Link Bitmap subfield corresponds to the link  
with the Link ID equal to *i* and is set to 1 to indicate that the link is used by the non-AP MLD for the  
EMLMR mode and is a member of the EMLMR links; otherwise the bit position is set to 0. The EMLMR  
Link Bitmap subfield is present if the EMLMR Mode subfield is equal to 1 and is not present otherwise.

(#11384)