IEEE P802.11  
Wireless LANs

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| LB271 Comment Resolution Clause 35 EMLSR Deferred CIDs  (Part 1) | | | | |
| Date: 2023-4-26 | | | | |
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Abstract

This submission proposes comment resolutions for the following 6 CIDs received in LB271 on TGbe D3.0 related to 35.3.17 EMLSR (related to changing ‘s’ to ‘(s)’ and adding ‘(s)’):

CIDs:

16054 15073 15927 16434 16553 15074

Revisions:

* Rev 0: Initial version of the document (moved 6 deferred CIDs in doc 11-23/340r5 to this document).

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| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 16054 | Binita Gupta | 35.3.17 | 563.41 | Clarify if EMLSR operation is supported on a single link, e.g. when an AP is removed and only a single EMLSR link remains for a given non-AP MLD. Similar scenario will happen when a link is disabled which was an EMLSR link for a non-AP MLD and it has only a single EMLSR link enabled. | Clarify requirements for single link EMLSR operation as per comment. | Revised  Clarified that EMLSR operation is supported on a single link.  TGbe editor to make the changes with the CID tag (#16054) in doc.: IEEE 802.11-23/0747r0  [https://mentor.ieee.org/802.11/dcn/22/11-23-0747-00-00be-lb271-cr-cl35-emlsr-deferred-cids.docx] |
| 15073 | Minyoung Park | 35.3.17 | 563.45 | EMLSR links should be changed to EMLSR link(s) since a non-AP MLD can operate in EMLSR mode when only one EMLSR link is available for the operation. | Replace EMLSR links to EMLSR link(s). Make similar changes throughout the subclause. (e.g., P563L56, P563L62, etc.) | Revised.  Agree with the comment.  TGbe editor to make the changes with the CID tag (#15073) in doc.: IEEE 802.11-23/0747r0  [https://mentor.ieee.org/802.11/dcn/22/11-23-0747-00-00be-lb271-cr-cl35-emlsr-deferred-cids.docx] |
| 15927 | Zhou Lan | 35.3.17 | 563.53 | There were some discussions in the group to allow the EMLSR operation over single-link, however currently some paragraphs are written so that the EMLSR operation is only allowed over more than one link (like page564/line15), and some other paragraphs are mixed (like page563/line53). Please fix this throughout subclass 35.3.17. | As in comment | Revised.  Agree with the comment. EMLSR operation is allowed for one EMLSR link.  TGbe editor to make the changes with the CID tag (#15073) in doc.: IEEE 802.11-23/0747r0  [https://mentor.ieee.org/802.11/dcn/22/11-23-0747-00-00be-lb271-cr-cl35-emlsr-deferred-cids.docx] |
| 16434 | Morteza Mehrnoush | 35.3.17 | 563.53 | There were some discussions in the group to allow the EMLSR operation over single-link, however currently some paragraphs are written so that the EMLSR operation is only allowed over more than one link (like page564/line15), and some other paragraphs are mixed (like page563/line53). Please fix this throughout subclass 35.3.17. | As in comment | Revised.  Agree with the comment.  EMLSR operation is allowed for one EMLSR link.  TGbe editor to make the changes with the CID tag (#15073) in doc.: IEEE 802.11-23/0747r0  [https://mentor.ieee.org/802.11/dcn/22/11-23-0747-00-00be-lb271-cr-cl35-emlsr-deferred-cids.docx] |
| 16553 | Arik Klein | 35.3.17 | 563.56 | The following sentence should clarify which bit positions in the EMLSR Link bitmap shall be set to 1, as suggested: "The EMLSR links shall be indicated in the EMLSR Link Bitmap subfield of the EML Control field of the EML Operating Mode Notification frame by setting the bit positions of the EMLSR Link Bitmap subfield to 1" | The sentence should be revised as follows: "The EMLSR links shall be indicated in the EMLSR Link Bitmap subfield of the EML Control field of the EML Operating Mode Notification frame by setting the bit positions \*corresponding to the Link ID value of these links in\* the EMLSR Link Bitmap subfield to 1" | Revised.  Agree with the comment.  TGbe editor to make the changes with the CID tag (#16553) in doc.: IEEE 802.11-23/0747r0  [https://mentor.ieee.org/802.11/dcn/22/11-23-0747-00-00be-lb271-cr-cl35-emlsr-deferred-cids.docx] |
| 15074 | Minyoung Park | 35.3.17 | 563.57 | "the bit positions of the EMLSR link bitmap subfield" should be "the bit position(s) of the EMLSR link bitmap" since there could be only one enabled link used for EMLSR mode. | Replace "the bit positions" to "the bit position(s)" | Revised.  Agree with the comment.  EMLSR operation is allowed for a EMLSR link.  TGbe editor to make the changes with the CID tag (#15073) in doc.: IEEE 802.11-23/0747r0  [https://mentor.ieee.org/802.11/dcn/22/11-23-0747-00-00be-lb271-cr-cl35-emlsr-deferred-cids.docx] |

**TGbe Editor to make the following changes related to changing ‘s’ to ‘(s)’ and adding ‘(s)’ in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D3.2: (#15073)**

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

The (#15044)EMLSR operation defined in this subclause allows a non-AP MLD with multiple receive chains to listen on (#16054)one or more EMLSR links when the corresponding non-AP STA(s) affiliated with the non-AP MLD are in awake state as defined below for an initial Control frame sent by an AP affiliated with an AP MLD in a non-HT (duplicate) PPDU, followed by frame exchanges on the link on which the initial Control frame was received.

In EMLSR mode, a non-AP MLD shall follow the rules defined in this subclause.

(#15882)An AP MLD with dot11EHTEMLSROptionActivated equal to true shall follow the rules defined in this subclause.

A non-AP MLD may operate in the EMLSR mode on a specified set of the enabled link(s) between the non-AP MLD and its associated AP MLD. The specified set of the enabled link(s) on which the EMLSR mode is applied is called EMLSR link(s). The EMLSR link(s) shall be indicated in the EMLSR Link Bitmap subfield of the EML Control field of the EML Operating Mode Notification frame by setting the bit position(s) of the EMLSR Link Bitmap subfield to 1. For the EMLSR mode enabled in a single radio non-AP MLD, the STA(s) affiliated with the non-AP MLD that operates on the enabled link(s) that corresponds to the bit position(s) of the EMLSR Link Bitmap subfield (#16256)equal to 0 shall be in doze state if a non-AP STA affiliated with the non-AP MLD that operates on one of the EMLSR link(s) is in awake state.

(#15073)NOTE - A non-AP MLD might only set one bit to 1 in the bit positions of the EMLSR Link Bitmap subfield when the non-AP MLD enables the EMLSR mode.

When a non-AP MLD with dot11EHTEMLSROptionActivated equal to true (re)associates with an AP MLD, the EMLSR mode is disabled by default.

An MLD with dot11EHTEMLSROptionActivated equal to true shall set the EML Capabilities Present subfield to 1 and shall set the EMLSR Support subfield in the Common Info field of the Basic Multi-Link element (9.4.2.312.2 (Basic Multi-Link element)) to 1 in all Management frames that include the Basic Multi-Link element except Authentication frames. An MLD with dot11EHTEMLSROptionActivated equal to false and dot11EHTEMLMROptionActivated equal to true (see 35.3.18 (Enhanced multi-link multi-radio operation)) shall set the EML Capabilities Present subfield to 1 and shall set the EMLSR Support subfield of the EML Capabilities subfield to 0. An MLD with dot11EHTEMLSROptionActivated equal to false and dot11EHTEMLMROptionActivated equal to false shall set the EML Capabilities Present subfield to 0.

When a non-AP MLD is operating in EMLSR mode on the EMLSR link(s), the non-AP STA(s) operating on the EMLSR link(s) and affiliated with the non-AP MLD shall not operate in dynamic SM power save mode (11.2.6 (SM power save)) on the EMLSR link(s).

When a non-AP MLD with dot11EHTEMLSROptionActivated equal to true intends to enable the EMLSR mode on the EMLSR link(s), (#15075)then:

— A non-AP STA affiliated with the non-AP MLD shall transmit an EML Operating Mode Notification

frame with the EMLSR Mode subfield of the EML Control field of the frame set to 1 to an AP affiliated with (#15562)its associated AP MLD with dot11EHTEMLSROptionActivated equal to true.

— An AP affiliated with the AP MLD (#16675)should (#15592)successfully transmit an EML

Operating Mode Notification frame, after the AP MLD is ready to serve the non-AP MLD in the EMLSR (#15112)operation, as a response to the received EML Operating Mode Notification frame, to (#16675)a non-AP STA that is in awake state and affiliated with the non-AP MLD(#16918), within the (#15080)transition timeout interval, and the following rules apply:

a) (#15884)The transition timeout interval is indicated in the Transition Timeout subfield in the

EML Capabilities subfield of the Basic Multi-Link element.

b) The transition timeout interval starts at the end of the PPDU[+SigExt] that is transmitted by the

AP affiliated with the AP MLD carrying the immediate acknowledgement to the EML

Operating Mode Notification frame transmitted by the STA affiliated with the non-AP MLD.

c) The EML Control field of the EML Operating Mode Notification frame transmitted by the AP

affiliated with the AP MLD is set to the same value as the EML Control field in the received

(#16232)EML Operating Mode Notification frame.

— (#15077)(#15563)The non-AP MLD shall operate in the EMLSR mode (#16919)on the EMLSR link(s)

and the other non-AP STA(s) affiliated with the non-AP MLD operating on the corresponding EMLSR link(s), which did not transmit the EML Operating Mode Notification frame, shall transition to active mode (#15885)without being required to transmit a frame with the Power Management subfield set to 0, either:

1. At the end of the (#15080)transition timeout interval, or

b) Before the end of the transition timeout interval, immediately after transmitting an

acknowledgment as a response to the received EML Operating Mode Notification frame from

one of the APs (#16675)affiliated with the AP MLD

, whichever comes first.

— Any of the other non-AP STA(s) operating on the corresponding EMLSR link(s) 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 (#16675)affiliated with the AP MLD or before the end of the (#15080)transition timeout interval, whichever comes first.

(#15076)When a non-AP MLD with dot11EHTEMLSROptionActivated equal to true intends to disable the EMLSR mode, then:

— A non-AP STA affiliated with the non-AP MLD shall transmit an EML Operating Mode Notification

frame with the EMLSR Mode subfield of the EML Control field of the frame set to 0 to an AP affiliated with (#15562)its associated AP MLD with dot11EHTEMLSROptionActivated equal to true.

— An AP affiliated with the AP MLD (#16675)should (#15592)successfully transmit an EML

Operating Mode Notification frame, after the AP MLD is no longer serving the non-AP MLD in the EMLSR (#15112)operation, as a response to the received EML Operating Mode Notification frame, to (#16675)a non-AP STA that is in awake state and affiliated with the non-AP MLD(#16918), within the (#15080)transition timeout interval, and the following rules apply:

a) (#15884)The transition timeout interval is indicated in the Transition Timeout subfield in the

EML Capabilities subfield of the Basic Multi-Link element.

b) The transition timeout interval starts at the end of the PPDU[+SigExt] that is transmitted by the

AP affiliated with the AP MLD carrying the immediate acknowledgement to the EML

Operating Mode Notification frame transmitted by the non-AP STA affiliated with the non-AP

MLD.

c) The EML Control field of the EML Operating Mode Notification frame transmitted by the AP

affiliated with the AP MLD is set to the same value as the EML Control field in the received

(#16232)EML Operating Mode Notification frame.

— (#15563)The non-AP MLD shall disable the EMLSR mode and the other non-AP STA(s) affiliated

with the non-AP MLD operating on the corresponding EMLSR link(s), which did not transmit the EML Operating Mode Notification frame, shall transition to power save mode (#15885)without being required to transmit a frame with the Power Management subfield set to 1, either:

1. At the end of the (#15080)transition timeout interval or

b) (#15080)Before the end of the transition timeout interval, immediately after transmitting an

acknowledgment as a response to the received EML Operating Mode Notification frame from

one of the APs (#16675)affiliated with the AP MLD

, whichever comes first.

— Any of the other non-AP STA(s) operating on the corresponding EMLSR link(s) shall not transmit a

frame with the Power Management subfield set to 0 before receiving the EML Operating Mode Notification frame from one of the APs (#16675)affiliated with the AP MLD or before the end of the (#15080)transition timeout interval, whichever comes first.

NOTE 1—Each of the STA(s) on the other link(s) of the EMLSR link(s) can transmit a frame with the Power Management subfield set to 1 and transition to power save mode immediately after successful transmission of the frame (#18059)as described in 11.2.3.2 (Non-AP STA power management modes).

When a non-AP MLD is operating in the EMLSR mode with an AP MLD supporting the EMLSR mode, the following applies(#17857):

a) The non-AP MLD shall be able to listen on the EMLSR link(s), by having its affiliated non-AP

STA(s) corresponding to those links in awake state. The listening operation includes CCA and

receiving the initial Control frame of frame exchanges that (#16923)are initiated by the AP MLD.

NOTE 2—A non-AP STA operating on one of the EMLSR link(s) can change its power management mode and

follows the procedure in 11.2 (Power management). A non-AP STA can listen on one of the EMLSR link(s) in

active mode or in PS mode when it is in awake state.

b) (#17857)On the EMLSR link(s), the group addressed frame(s) that are expected to be received by

the non-AP MLD shall be buffered and delivered following the rules defined in 35.3.15 (Multi-link operation group addressed frames).

…

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. (#15073)The AP MLD and the non-AP MLD shall use the updated EMLSR padding delay, the EMLSR transition delay, and the EMLSR Link Bitmap value in the most recent EML Operating Mode Notification frame with the EMLSR Parameter Update field successfully transmitted by the non-AP MLD.

g) The non-AP MLD shall be switched back to the listening operation on the EMLSR link(s) 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:

…

i) Any one of the non-AP STA(s) affiliated with the non-AP MLD that is operating on one of the

EMLSR link(s) may initiate frame exchanges with the AP MLD.

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

• The non-AP MLD shall be switched back to the listening operation on the EMLSR link(s) after the

time duration indicated in the EMLSR Transition Delay subfield after the end of the

TXOP(#17857).