IEEE P802.11
Wireless LANs

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| LB 266 CR for EMLSR Misc. |
| Date: 2022-10-25 |
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Abstract

This submission proposes resolutions for following 4 CID received for TGbe LB266

: 10038, 10777, 12812, 13854

Revision History:

* Rev 0: Initial version of the document

***TGbe editor: The baseline for this document is 11be D2.0***

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).***

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 10038 | Morteza Mehrnoush | 35.3.17 | 461.58 | What is the EMLSR behavior if all EMLSR STAs of the non-AP MLD except one goes to power save (doze state)? As there is only one link remaining in EMLSR mode, it should follow the single-link single-radio procedure. Add explanation to cover this case. | as in comment | **Revised**Agree in principle with the comment.Add a capability bit to indicate the non-AP MLD supporting no initial control frame when only one link of EMLSR links is in awake state so that the AP MLD can begin the frame exchange without the initial control frame in such case.**TGbe editor, please make changes as shown in this document tagged 10038** |
| 10777 | Chien-Fang Hsu | 35.3.17 | 461.58 | When there exists only one EMLSR link in awake state and others are on in doze state, the initial control frame to initialize DL traffic is redundant. To increase efficiency in this scenario, the specs should allow AP to omit initial control frame to intialize DL transmission. | Add rules allowing the AP to intialize DL transmission without initial control frame when only one EMLSR link is in awake state and others are in doze states. | **Revised**Agree in principle with the comment.Add a capability bit to indicate the non-AP MLD supporting no initial control frame when only one link of EMLSR links is in awake state so that the AP MLD can begin the frame exchange without the initial control frame in such case.**TGbe editor, please make changes as shown in this document tagged 10777** |
| 12812 | Laurent Cariou | 35.3.17 | 463.60 | When a non-AP MLD is in EMLSR mode and when only one STA that is operating on one of the EMLSR links is in awake state and the other STAs operating on the EMLSR links affiliated with the same non-AP MLD are in doze state, the non-AP MLD doesn't need to wait for the EMLSR Transition Delay time to switch to the listening operation. | Please add an exception as follows: "When there is only one STA in awake state operation on the EMLSR links, the non-AP MLD switches back to the listening operation after the end of the frame exchanges for both an AP initiated and a STA initiated cases without waiting for the EMLSR Transition Delay time." | **Revised**Agree in principle with the comment.Add a capability bit to indicate the non-AP MLD supporting no transition delay when only one link of EMLSR links is in awake state so that the AP MLD can consider that the non-AP MLD does not need transition delay in such case.**TGbe editor, please make changes as shown in this document tagged 12812** |
| 13854 | Sanghyun Kim | 35.3.17 | 461.55 | There are cases that only one EMLSR link is enabled.For example:1. One of the two EMLSR links is removed after a reconfiguration procedure performed by a AP MLD.2. One of the two EMLSR links is disabled by a newly negotiated TID-to-Link mapping.A non-AP MLD does not need to operate in the EMLSR mode if the non-AP MLD has only the single (enabled) EMLSR link, this is because the EMLSR mode cause unnecessary overhead with no benefit for this case. | Please define a restriction on the EMLSR mode operation regarding the number of enabled EMLSR links.If a non-AP MLD has only one EMLSR link enabled, the AP MLD and the non-AP MLD shall consider that the EMLSR mode of the non-AP MLD is deactivated without additional signaling. | **Revised**It is possible that a non-AP MLD keeps operating in EMLSR mode when there is only one enabled EMLSR link. It may bring power save benefit. Thus, in such case, it is not necessary to force the non-AP MLD to disable the EMLSR mode. Add a note to clarify the scenario. **TGbe editor, please make changes as shown in this document tagged 13854** |

***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.***

**No Discussion:**

### 9.4.2.312.2.2 Common Info field of the Basic Multi-Link element

TGbe editor: please modify ***the following figures of subclause 9.4.2.312.2.2 in TGbe D2.0*** ***:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Common Info Length | MLD MACAddress | Link ID Info | BSSParameters Change Count | Medium Synchronization Delay Information | EMLCapabilities | MLDCapabilities and Operations | MLD ID |

Octets: 1 6 0 or 1 0 or 1 0 or 2 0 or 3 0 or 2 0 or 1

 **Figure 9-1002h—Common Info field of the Basic Multi-Link element format** *(#12812, 10777, 10038)*

B0 B1 B3 B4 B6 B7 B8 B10 B11 B14 B15 B16 B17 B23

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EMLSRSupport | EMLSRPadding Delay | EMLSRTransition Delay | EMLMRSupport | EMLMRDelay | Transition Timeout | No Initial Control Frame Required | No EMLSR Transition Delay Required  | Reserved |

Bits: 1 3 3 1 3 4 1 1 7

 **Figure 9-1002k—EML Capabilities subfield format** *(#12812, 10777, 10038)*

TGbe editor: ***add the following paragraphs of subclause 9.4.2.312.2.2 after Table 9-401h(Encoding of the Transition Timeout subfield) in TGbe D2.0 :***

(#12812, 10777, 10038)When the No Initial Control Frame Required subfield is included in a frame sent by a STA affiliated with a non-AP MLD, the No Initial Control Frame Required subfield indicates support thatinitial control frame is not required when there is only one STA in awake state and affiliated with the non-AP MLD operating on the EMLSR links. If the No Initial Control Frame Required subfield is included in a frame sent by an AP affiliated with an AP MLD, the No Initial Control Frame Required subfield is reserved.

(#12812, 10777, 10038)When No EMLSR Transition Delay Required subfield is included in a frame sent by a STA affiliated with a non-AP MLD, No EMLSR Transition Delay Required subfield indicates support that the EMLSR Transition Delay is not required when switching back to the listening operation and when there is only one STA in awake state and affiliated with the non-AP MLD operating on the EMLSR links. If No EMLSR Transition Delay Required subfield is included in a frame sent by an AP affiliated with an AP MLD, the No EMLSR Transition Delay Required subfield is reserved.

### 35.3.17 Enhanced multi-link single radio operation

***TGbe Editor to make the following changes in the paragraph in P463L25 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D2.0:***

An AP affiliated with the AP MLD that initiates frame exchanges 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 (#12812, 10777, 10038)except when there is only one STA in awake state and affiliated with the non-AP MLD operating on the EMLSR links and the No Initial Control Frame Required subfield of the EML Capabilities  subfield  in  the  Common  Info  field  of  the  Basic  Multi-Link  element is set to 1 by the non-AP MLD, the AP affiliated with the AP MLD may begin the frame exchange without transmitting the initial Control frame.

***TGbe Editor to make the following changes in the paragraph in P463L47 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D2.0:***

(#12812, 10777, 10038) If an AP affiliated with the AP MLD begins the frame exchanges by transmitting the initial Control frame, after receiving the initial Control frame of frame exchanges and transmitting an immediate response frame as a response to the initial Control frame, a 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 in 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, ….

***TGbe Editor to add the paragraph below after the paragraph in P463L47-L58 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D2.0:***

(#12812, 10777, 10038) — If there is only one STA in awake state and affiliated with the non-AP MLD operating on the EMLSR links and the No Initial Control Frame Required subfield of the EML Capabilities  subfield  in  the  Common  Info  field  of  the  Basic  Multi-Link  element is set to 1 by the non-AP MLD, the STA affiliated with the non-AP MLD subject to its spatial stream capabilities, and operation mode shall be capable of receiving a PPDU that is sent using more than one spatial stream on the link. During the frame exchanges, the other AP(s) affiliated with the AP MLD shall not transmit frames to the other STA(s) affiliated with the non-AP MLD on the other EMLSR link(s).

***TGbe Editor to make the following changes in the paragraph in P463L59 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D2.0:***

The non-AP MLD shall be switched back to the listening operation on the EMLSR links after thetime indicated in the EMLSR Transition Delay subfield of the EML Capabilities subfield in theCommon Info field of the Basic Multi-Link element if any of the following conditions is met and thisis defined as the end of the frame exchanges (#12812, 10777, 10038)except when there is only one STA in awake state and affiliated with the non-AP MLD operating on the EMLSR links and No EMLSR Transition Delay Required subfield of the EML Capabilities  subfield  in  the  Common  Info  field  of  the  Basic  Multi-Link  element is set to 1 by the non-AP MLD, the non-AP MLD switches back to the listening operation if any of the following conditions is met without waiting for the time indicated in the EMLSR Transition Delay subfield :

***TGbe Editor to add a note after the paragraph in P463L3~L12 in Subclause 35.3.17 (Enhanced multi-link single radio operation) in TGbe D2.0:***

A non-AP MLD may operate in the EMLSR mode on a specified set of the enabled links between the non-

AP MLD and its associated AP MLD. …

(#13854)Note — A non-AP MLD may have only one enabled link of the specific set after TID-to-link mapping negotiation, ML reconfiguration, etc. The non-AP MLD may continue to operate in EMLSR mode on the EMLSR link or disable the EMLSR mode on the EMLSR link by procedures as defined in this subclause.