IEEE P802.11Wireless LANs

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| Proposed Resolutions to some 11be LB266 CIDs on EMLSR | | | | |
| Date: 2022-12-01 | | | | |
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Abstract

This submission proposes the resolutions to 11be LB266 CIDs 11366, 11368, and 11369.

The page and line numbers refer to those in 11be\_D2.3 [1].

**Introduction**

This submission proposes the resolutions to 11be LB266 CIDs 11366, 11368, and 11369.

The page and line numbers refer to those in 11be\_D2.3 [1].

**Comments:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Page.Line | Clause | Comment | Proposed change | Resolution |
| 11366 | Qi Wang | 218.39 | 9.4.2.312.2.2 | Table 9-401h: A long EMLSR Transition Timeout causes significant restriction on the power save behavior of the STAs operating in the EMLSR mode. Please remove the large values from the allowed values of the Transition Timeout subfield. | As in comment. | Revised.  Agree with the commenter. In addition to removing the large values for Transition Timeout, we also propose to define the EMLSR Transition Delay values with a finer resolution to reduce an AP’s wait time if the non-AP MLD has already returned to the listening mode.  TGbe editor: please incorporate the proposed text changes tagged with #11366 in this document. |
| 11368 | Qi Wang | 462.  52 | 35.3.17 | "A STA on one of the other links of the EMLSR links shall not transmit a frame with the Power Management subfield set to 1 before receiving the EML Operating Mode Notification frame from the AP affiliated with the AP MLD or before the end of the timeout interval." Why is this restriction necessary? When the EMLSR Transition Timeout value is large, this requirement poses strong and unnecessary restrictions of the power save of non-AP STAs. | Please delete the quoted text. | Revised.  Agree with the commenter in principle. However, instead of removing the sentence, we propose to add the text to indicate that the said sentence is applicable only when the Transition Timeout value is less than or equal to 4 TUs.  TGbe editor: please incorporate the proposed text changes tagged with #11368 in this document. |
| 11369 | Qi Wang | 463. 10 | 35.3.17 | "A STA on one of the other links of the EMLSR links shall not transmit a frame with the Power Management subfield set to 0 before receiving the EML Operating Mode Notification frame from the AP affiliated with the AP MLD or before the end of the timeout interval." Why is this restriction necessary? When the EMLSR Transition Timeout value is large, this requirement poses strong and unnecessary restrictions of the power save of non-AP STAs. | Please delete the quoted text. | Revised.  Agree with the commenter in principle. However, instead of removing the sentence, we propose to add the text to indicate that the said sentence is applicable only when the Transition Timeout value is less than or equal to 4 TUs.  TGbe editor: please incorporate the proposed text changes tagged with #11369 in this submission. |

1. **Discussion:**

None.

1. **Proposed resolution:**

**9.4.2.312.2.3 Common Info field of the Basic Multi-Link element**

***11be Editor: Please change the text on P238 in 11be\_D2.3[1] as shown below. (#11366)***

The EMLSR Transition Delay subfield indicates the transition delay time needed by a non-AP MLD to switch from exchanging frames on one of the enabled links to the listening operation on enabled links (see 35.3.17 (Enhanced multi-link single radio operation). (#11122) When the EMLSR Transition Delay subfield is included in a frame sent by an AP affiliated with an AP MLD, the EMLSR Transition Delay sub- field is reserved. The EMLSR Transition Delay subfield (#11391)includes 3 bits and is set as defined in Table 9-401f (Encoding of the EMLSR Transition Delay subfield(#11391)).

**Table 9-401f—Encoding of the EMLSR Transition Delay subfield(#11391) (#11366)**

|  |  |
| --- | --- |
| **EMLSR Transition Delay subfield value** | **EMLSR transition delay** |
| 0 | 0 us |
| 1 | 16 us |
| 2 | 32 us |
| 3 | 48 us |
| 4 | 64 us |
| 5 | 80 us |
| 6 | 96 us |
| 7 | 256 us |

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***11be Editor: Please change the text on P239 in 11be\_D2.3[1] as shown below. (#11366)***

The Transition Timeout subfield indicates the timeout value for EML Operating Mode Notification frame exchange in EMLMR mode (see 35.3.18 (Enhanced multi-link multi-radio operation)) and EMLSR mode (see 35.3.17 (Enhanced multi-link single radio operation)).

When the Transition Timeout subfield is included in a frame sent by an AP affiliated with an AP MLD, the Transition Timeout subfield is set as defined in Table 9-401h (Encoding of the Transition Timeout subfield). When the Transition Timeout subfield is included in a frame sent by a non-AP STA affiliated with a non-AP MLD, the Transition Timeout subfield is (#13754)reserved.

**Table 9-401h—Encoding of the Transition Timeout subfield (#11366)**

|  |  |
| --- | --- |
| **Transition Timeout subfield value** | **Transition timeout** |
| 0 | 0 us |
| 1 | 128 us |
| 2 | 256 us |
| 3 | 512 us |
| 4 | 1 TU |
| 5 | 2 TUs |
| 6 | 4 TUs |
| 7 | 8 TUs |
| 8-15 | Reserved |

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

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***11be Editor: Please modify the text on P518 in 11be\_D2.3[1] as shown below.***

When a non-AP MLD with (#11811)dot11EHTEMLSROptionAcitivated equal to true intends to (#12675)enable the EMLSR mode on the EMLSR links, a (#12242)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 an AP MLD with (#11811)dotEHTEMLSROptionaActivated equal to 1 to true. An AP affiliated with the MLD that received the EML Operation Mode Notification frame from the (#12242)non-AP STA affiliated with the non-AP MLD should transmit an EML Operating Mode Notification frame (#11456)with the EML Control field set to the same value as the EML Control field in the received EML Operation Mode Notification frame, after the AP MLD is ready to serve the non-AP MLD in the EMLSR mode operation, to one of the (#12242)non- AP STAs affiliated with the non-AP MLD within the timeout interval indicated in the Transition Timeout subfield in the EML Capabilities subfield of the Basic Multi-Link element starting at the end of the PPDU (#12676)that is transmitted by the AP affiliated with the AP MLD (#11582)carrying the immediate acknowledgement to the EML Operating Mode Notification frame transmitted by the STA affiliated with non-AP MLD. After the successful transmission of the EML Operating Mode Notification frame (#13411)(#11454)(#14000)by the (#12242)non-AP STA affiliated with the non-AP MLD, the non-AP MLD shall operate in the EMLSR mode and the other STAs operating on the corresponding EMLSR links shall transition to active mode after the transition delay indicated in the Transition Timeout subfield in the EML Capabilities subfield of the Basic Multi-Link element or immediately after receiving an EML Operation Mode Notification frame from one of the APs operating on the EMLSR links and affiliated with the AP MLD. If the value of the Transition Timeout subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element carried in a (Re)Association Response frame is less than or equal to 6 (which corresponds to 4 TUs), any of the other 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 (#13415)one of the APs operating on the EMLSR links and affiliated with the AP MLD or before the end of the timeout interval. (#11368)

When a non-AP MLD with (#11811)dot11EHTEMLSROptionActivated equal to true intends to disable the EMLSR mode, a (#12242)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 an AP MLD with (#11811)dot11EHTEMLSROptionActivated equal to true. An AP affiliated with the AP MLD that received the EML Operating Mode Notification frame from the (#12242)non-AP STA affiliated with the non-AP MLD should transmit an EML Operating Mode Notification frame (#11456)with the EML Control field set to the same value as the EML Control field in the received EML Operation Mode Notification frame, after the AP MLD is no longer serving the non-AP MLD in the EMLSR mode operation, to one of the (#12242)non-AP STAs affiliated with the non-AP MLD within the timeout interval indicated in the Transition Timeout subfield in the EML Capabilities subfield of the Basic Multi-Link element starting at the end of the PPDU (#12678)that is transmitted by the AP affiliated with the AP MLD (#11582)carrying the immediate acknowledgement to the EML Operating Mode Notification frame transmitted by the (#12242)non-AP STA affiliated with the non-AP MLD. After the successful transmission of the EML Operating Mode Notification frame (#13416)(#11455)(#14000)by the non-AP(#12242)non-AP STA affiliated with the non-AP MLD, the non-AP MLD shall disable the EMLSR mode and the other STAs operating on the corresponding EMLSR links shall transition to power save mode after the transmission delay indicated in the Transition Timeout subfield of the EML Capabilities subfield of the Basic Multi-link element on the EMLSR links and affiliated with the AP MLD. If the value of the Transition Timeout subfield of the EML Capabilities subfield in the Common Info field of the Basic Multi-Link element carried in a (Re)Association Response frame is less than or equal to 6 (which corresponds to 4 TUs), ny of the other STAs operating on the corresponding EMLSR link shall not transmit a frame with the Power Management subfield set to 0 before receiving the EML Operating Mode Notification frame from (#13415)one of the APs operating on the EMLSR links and affiliated with the AP MLD or before the end of the timeout interval. (#11369)

**References**

[1] IEEE P802.11be™/D2.2, Draft standard for information technology – Telecommunications and information exchange between systems local and metropolitan area networks – Specific requirements Part 11: Wireless LAN medium access control (MAC) and physical layer (PHY) specifications, Amendment 9: Enhancements for extremely high throughput (EHT)

Amendment 4: Enhancements for positioning