IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB266 CR for subclause 9 | | | | |
| Date: 2022-09-30 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Ming Gan | Huawei  Huawei |  |  | ming.gan@huawei.com |
| Jason Yuchen Guo |  |  |  |
| Yunbo Li | Huawei |  |  |  |
| Guogang Huang | Huawei |  |  |  |
| Yiqing Li | Huawei |  |  |  |
| Mengyao Ma | Huawei |  |  |  |
| Hongjia Su | Huawei |  |  |  |
| Michanel Montemurro | Huawei |  |  |  |
| Stephen McCann | Huawei |  |  |  |
| Edward Au | Huawei |  |  |  |
| Osama Aboul-Magd | Huawei |  |  |  |

Abstract

This submission proposes resolutions of comments received from TGbe comment collection LB266 based on TGbe D2.2.

13452 12245 10531 13723 11830 11831 11488 13047 11832 12159 12591 12232 11863 11118

(14 CIDs)

Revisions:

* Rev 0: Initial version of the document.
* Rev 3: A change to the resolution of CID 12245

1. **Introduction**

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. The introduction and the explanation of the proposed changes are 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 802.11be editor on how to merge the text with the baseline documents).***

***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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 13452 | 9.2.4.7.10 | 127.46 | extend the usage of AAR to eMLSR/eMLMR link set. | As in comment. | Revised-  Agree with the comment in principle. Apply the changes marked as #13452 in this document. |
| 12245 | 9.2.4.7.10 | 127.50 | What is an "assisting AP". There are only 2 occurences of this term in clause 35.3.16.8.3 and it doesn't appear to be useful. | Change each occurrence of "assisting AP" in the draft to "AP" | Revised-  Add the definition for “assisting AP” and “assisted STA” like “TWT scheduling AP” in the base line . Apply the changes marked as #12245 in this document. |
| 10531 | 9.2.3.7.10 | 128.16 | The second sentence of this paragraph covers the behavioral aspect of this feature which needs to be covered under normative text. | Delete this sentence and add a corresponding normative sentence (if not already present) in the appropriate subclause of 35.3. | Revised-  Agree with the comment in principle. Delete the corresponding sentence since it belongs to the normative behavior. Apply the changes marked as #10531 in this document. |
| 13723 | 9.2.4.7.10 | 128.18 | For clarify, changes "bit position I" to "Bi" in this paragraph, and changes " "bit position 15" to "B15" in next paragraph. | as in comment. | Rejected-  “bit position n” is widely used in baseline (802.11 REVme D1.4) while “Bn” is also used. |
| 11830 | 9.2.4.7.10 | 128.19 | Not all "I"s are italic. Make them italic. | As in comment. | Revised-  Agree with the comment in principle. Apply the changes marked as #11830 in this document. |
| 11831 | 9.2.4.7.10 | 128.19 | Sentence is confusing. The bit in position i indicates the link (i.e., link ID is the link identifier no matter what). What you mean perhaps is that the value 0 indicates that the STA is not requesting assistance by the AP that is operating in link i if the bit is set to 0. Same consideration for the other bit value. | As in comment. | Revised-  Agree with the comment in principle. Apply the changes marked as #11831 in this document. |
| 11488 | 9.2.4.7.10 | 128.20 | The language may not be correct. A value of 1 means that the AP with Link ID i is being requested to send a trigger frame, correct? Not that the AP is identified with a link ID i. Please clarify and rewrite. | as in comment | Revised-  Agree with the comment in principle. Apply the changes marked as #11488 in this document. |
| 13047 | 9.2.4.7.10 | 128.25 | This is not helping, in fact it complicates the implementation because the parser of AAR Control field, will have to check which AP link received this MPDU which carries the AAR A-Control field, then to add it into the assisting AP list. Instead, all the assisting AP Link IDs are marked as 1, then the parser does not need to do the check. | As suggested in the comment | Rejected-  The AAR is used to help the non-AP STA recover the medium synchronization. Internal info exchange within one MLD is not a big issue especially since it is required for many multi-link operations, such as AP MLD discovery and multi-link setup. |
| 11832 | 9.2.4.7.10 | 128.27 | If bit 15 is reserved and the next 4 bits are reserved then would it make sense to have the bitmap 15 bits and have 5 bits reserved? | As in comment. | Revised-  Agree with the comment in principle. Apply the changes marked as #11832 in this document. |
| 12159 | 9.4.1.6 | 179.11 | It is not clear that the STA has to select the value for this field based on the TID-to-Link mapping, i.e. the STA has to receive Beacons on as many links as needed to determined BUs for all TIDs. E.g. if a link is disabled, does the STA consider it for the selection of the Listen Interval? | Explain how the TID-to-Link mapping affects selection of Listen Interval. | Rejected-  TID-to-Link mapping doesn't affect the selection of a listen Interval. The listen interval is chosen by the non-AP STA itself and depends on the demand of power save. Once the listen interval is decided, then the value of Listen Interval field is calculated based on its unit where the unit is the maximum value of beacon intervals corresponding to the links that the non-AP MLD intends to setup in the (Re)Association Request frame. |
| 12591 | 9.4.1.6 | 179.09 | There are no units of maximum values of Beacon intervals, as cited in the following sentence:" The value is in units of the maximum value of beacon intervals corresponding to the links that the non-AP MLD intends to setup in the (Re)Association Request frame maximum value of beacon intervals". Please rephrase the sentence as proposed | The sentence should be rephrased as follows: "The value equals to the maximal value of beacon intervals corresponding to each of the links that the non-AP MLD intends to setup in the (Re)Association Request frame" | Revised-  There is perhaps a misunderstanding from the commenter. To make it clear, this sentence is clarified. Apply the changes marked as #12591 in this document. |
| 12232 | 9.4.1.6 | 179.19 | This sentence is no longer clear. Does it describe a non-AP MLD that does not enter power save mode, or the affiliated STAs of a non-AP MLD. I think it's the latter. | Change the cited sentence to "NOTE--The value 0 might be used by a STA that is not affiliated with an MLD and never enters power save mode, or by a non-AP MLD whose affiliated STAs never enter power save mode." | Revised-  Agree with the comment in principle. Apply the changes marked as #12232 in this document. |
| 11863 | 9.4.2.199 | 205.42 | Multi-Link Information element is providing the same functionality as this Link ID Bitmap field in the TWT element. Use one single way of signaling for simplicity. | As in comment. | Rejected-   According to subclause 35.8.2 (Individual TWT agreements), more than one TWT element could be carried in a TWT setup frame and these TWT elements could also be applied to different link sets. However, a Multi-Link Information element can’t have the above-mentioned functionality as the Link ID Bitmap subfield. |
| 11118 | 9.4.2.199 | 207.24 | "The Link ID Bitmap subfield indicates the links to which the TWT element sent by a STA affiliated with an MLD applies." is confusing because the TSF is different in general on each link, so the meaning of time parameters such as the Target Wake Time field (and, due to ppm offsets, even the TWT Wake Interval Mantissa and Exponent) are unclear. Are the time parameters wrt each link's timebase, or the timebase of the link on which this element was transmitted? Clause 11/35 language is needed. I see something in 35.8.2 Individual TWT agreements, but only for individual TWT agreements. Also a lot of the text deals with the case of a one-hot bitmap and multiple elements, not a many-hot bitmap and one element. | Add a xref to 36.8 to clarify the meaning of time in this multi-link case. Add language in 35.8 to define the applicable timebase for the case of a) when indicated link(s) in the bitmap correspond ot a different link that the one carrying the bitmap and b) broadcast TWT signaling. | Revised-  The time parameters are with respect to each link's TSF, not the TSF of the link on which this element is transmitted. A reference is added. Apply the changes marked as #11118 in this document. |
| 10533 | 9.3.3.2 | 172.11 | Update entry for TWT element to state that TWT IE is present if dot11RestrictedTWTOptionImplemented is equal true. Also add normative text in clause 35. | As in comment | Revised-  Agree with the comment in principle, but the normative text is already covered by the following sentence in 802.11 draft 2.2, "If there is any R-TWT membership set up, the EHT AP shall announce the R-TWT schedule information by including Restricted TWT Parameter Set field(s) in the broadcast TWT element as specified in 9.4.2.199 (TWT element) contained in transmitted Management frames, which are specified in 26.8.3 (Broadcast TWT operation)." Apply the changes marked as #10533 in this document. |

**Discussion:** None.

***TGbe editor: Please modify the subclause as follows***

**3. Definitions, acronyms, and abbreviations**

**3.1 Definitions**

Insert the following definitions (maintaining alphabetical order):

multi-link device (MLD) max idle period: A time period during which the access point (AP) MLD does not disassociate a non-AP MLD due to nonreceipt of frames from any of the stations (STAs) affiliated with that non-AP MLD.

assisting access point (AP): An AP affiliated with an AP MLD that provides the medium synchronization recovery service. (#12245)

assisted station (STA): A non-AP STA affiliated with a non-AP MLD that is provided the medium synchronization recovery service. (#12245)

**9.2.4.7.10 AAR Control**

The Control Information subfield in an AAR Control subfield contains information of the link identifier(s) of the assisting AP(s) affiliated with an AP MLD that are requested to assist a non-AP STA affiliated with a non-AP MLD, belonging to an NSTR link pair or operating on an EMLSR/EMLMR link (#13452), to recover its medium synchronization (35.3.16.8.3 (AP assisted medium synchronization recovery procedure)).

The format of this subfield is shown in Figure 9-33c (Control Information subfield format in an AAR Con-trol subfield).

|  |  |  |
| --- | --- | --- |
|  | B0      B14 | B15 B19 |
|  | Assisting AP Link ID Bitmap (CID #4141, 4805) | Reserved |
| Bits: | 15 | 5 |
| **Figure 9-33c – Control Information subfield format in an AAR Control subfield** | | |

(#11832)

The Assisting AP Link ID Bitmap subfield in the AAR Control subfield indicates the link(s) associated with the link identifier(s) of the assisting AP(s) affiliated with an AP MLD. (#10531) A value of 1 in bit position *i* of the Assisting AP Link ID Bitmap subfield indicates that the AP operating on link ID *i* is requested to assist with the recovery of medium synchronization. A value of 0 in bit position *i* of the Assisting AP Link ID Bitmap subfield indicates that the AP operating on link ID *i* is not requested to assist with the recovery of medium synchronization. (#11831, 11488, 11830)

The bit in the Assisting AP Link ID Bitmap subfield, which corresponds to the AP to which the AAR Control field is addressed, is set to 0. (#11832)

**9.4.1.6 Listen Interval field**

NOTE—The value 0 might be used by a STA that is not affiliated with an MLD and never enters power save mode or by a non-AP MLD whose all affiliated STAs never enter power save mode. (#12232)

**9.4.2.199 TWT element**

Page 207 line 21

The Link ID Bitmap subfield indicates the links to which the TWT element sent by a STA affiliated with an MLD applies (see 35.3.24.2 (Individual TWT agreements)) (#11118). A value of 1 in bit position *i* of the Link Bitmap subfield means that the link to which the TWT element sent by a STA affiliated with an MLD applies. A value of 0 in bit position *i* of the Link Bit-map subfield means that the link associated with the link ID *i* is not the link to which the TWT element sent by a STA affiliated with an MLD applies.

**9.3.3 (PV0) Management frames**

**9.3.3.2 Beacon frame format**

***Update existing order 12 and insert four new rows to Table 9-60 (Beacon frame body) in numeric order:***.

**Table 9-60—Beacon frame body**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 79 | TWT | The TWT element is optionally present if dot11TWTOptionActivated is true; otherwise, it is not present.  The TWT element is optionally present if dot11RestrictedTWTOptionImplemented is true; otherwise, it is not present (#10533) |