IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB266 CR for subclause 35.3.4.4 | | | | |
| Date: 2022-08-25 | | | | |
| 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 D2.0.

10227 10228 10229 10230 11730 13506 10623 10624 10625 11415 13354 11416 11556 11557 11941 12479 13353 12802 13352 11324 10231 13868 11558 14064 (24 CIDs)

Revisions:

* Rev 0: Initial version of the document.

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** |
| 10227 | 35.3.4.4 | 417.42 | The clause describing the fact that the Probe Response is not a Multi-Link probe response is a necessary condition, and thus should use "that" rather than "which" | Rephrase as "If an AP affiliated with an AP MLD is not in a multiple BSSID set or the AP corresponds to a transmitted BSSID in a multiple BSSID set, the AP shall include, in a Beacon frame or a Probe Response frame that is not a Multi-Link probe response, only the Common Info field of the Basic Multi-Link element for the AP MLD ..." | Accepted- |
| 10228 | 35.3.4.4 | 417.49 | The clause describing the fact that the Probe Response is not a Multi-Link probe response is a necessary condition, and thus should use "that" rather than "which" | Rephrase as "If an AP affiliated with an AP MLD corresponds to a nontransmitted BSSID in a multiple BSSID set, then the AP that corresponds to the transmitted BSSID in the same multiple BSSID set shall include, in the nontransmitted BSSID profile corresponding to the nontransmitted BSSID in a Beacon frame or a Probe Response frame that is not a Multi-Link probe response, only the Common Info field of the Basic Multi-Link element ..." | Accepted- |
| 10229 | 35.3.4.4 | 417.58 | The clause describing the fact that the Probe Response is not a Multi-Link probe response is a necessary condition, and thus should use "that" rather than "which" | Rephrase as "The Common Info field of the Basic Multi-Link element carried in the Beacon frame or Probe Response frame that is not a Multi-Link probe response, shall include the MLD MAC address ..." | Accepted- |
| 10230 | 35.3.4.4 | 418.04 | There is a missing word (any) in the description of the variant | Rephrase as "A Probe Request frame that is a Multi-Link probe request shall include a Probe Request Multi-Link element and shall not include any other Multi-Link element variant." | Revised-  Agree with the comment in principle. Apply the changes marked as #10230 in this document. |
| 11730 | 35.3.4.4 | 418.06 | Rephrase it to "... shall not include any other variant of Multi-Link element." | as in comment | Accepted- |
| 13506 | 35.3.4.4 | 418.06 | I propose to pluralise "variants" and add "of the" after variants and before Multi-Link element. | Change "shall not include other variant Multi-Link element." to "shall not include other variants of the Multi-Link element." | Revised-  Agree with the comment in principle. Apply the changes marked as #13506 in this document |
| 10623 | 35.3.4.4 | 417.43 | Missing 'then'. Also needs to say 'in its Beacon and Probe Response frame'. The rules apply to both Beacon and Probe Response, hence change 'or' to 'and'. | Replace the first sentence as: "... multiple BSSID set, then the AP shall include, in its Beacon frame and Probe Response frame, ..." | Revised-  Agree with the comment in principle. Apply the changes marked as #10623 in this document. |
| 10624 | 35.3.4.4 | 417.46 | Update reference to point to Basic Multi-Link element (9.4.2.312.2). Same comment for the following paragraph. | As in comment | Revised-  Agree with the comment in principle. Apply the changes marked as #10624 in this document. |
| 10625 | 35.3.4.4 | 417.55 | Description in clause 9.4.2.312.2 explains which subfields are present in the Common Info field and includes the conditions or references to normative text in clause 35.3.x. Duplicating information runs the risk of making different part of the spec out of sync. This paragraph doesn't need to duplicate clause 9 | Delete the cited paragraph | Revised-  The conditions for including subfields belong to normative behavior. Delete the corresponding text in clause 9.4.2.312.2.  Apply the changes marked as #10625 in this document. |
| 11415 | 35.3.4.4 | 417.60 | There is no need to specify the presence of mandatory fields (such as MLD MAC address). | Either remove 'MLD MAC address' from the list or add 'Common Info length' subfield to the list. Also, 'A' should be capitalized in 'MLD MAC address'. | Revised-  Agree with the comment in principle. Apply the changes marked as #11415 in this document. |
| 13354 | 35.3.4.4 | 417.60 | change "MLD MAC address," to "the MLD MAC Address," | As in comment | Accepted- |
| 11416 | 35.3.4.4 | 417.63 | An AP MLD does not include MLD ID subfield in the Common Info field of Beacons and Probe Response frame that is not an ML probe response. | Add 'MLD ID' in the list of subfields not carried in the Common Info field in the Basic ML element carried in Beacons and Probe Response frame that is not an ML probe response. | Revised-  Agree with the comment in principle. Apply the changes marked as #11416 in this document. |
| 11556 | 35.3.4.4 | 417.44 | This normative behavior is incorrect since clearly there are also other fields in the ML element, such as Multi-link Control. Please correct the sentence | as in comment | Revised-  Agree with the comment in principle. Apply the changes marked as #11556 in this document. |
| 11557 | 35.3.4.4 | 417.53 | This normative behavior is incorrect since clearly there are also other fields in the ML element, such as Multi-link Control. Please correct the sentence | as in comment | Revised-  Agree with the comment in principle. Apply the changes marked as #11557 in this document. |
| 11941 | 35.3.4.4 | 414.62 | 802.11be scanning clause does not explain how the BSS Load elements in the different affiliated APs are considered in the scanning. The link specific Load information helps non-AP MLDs to select low congestion level AP MLD for assocition or to select the links in which the STA sends data. | Please add clarifications how AP MLD signals the load information of set of affiliated in a new ML Load or by using the basic ML element. | Rejected-  The Beacon frame advertised on each link carries BSS load info. Non-AP MLD can obtain it by listening to the Beacon frames. |
| 12479 | 35.3.4.4 | 417.61 | For single link AP MLD the BSS Parameters Change Count is not needed | Modify the text accordingly | Rejected-  AP MLD is capable of at least two APs. Even if it is single link AP MLD, one or more links could be added later And therefore, the BSS parameters change count is still needed. |
| 13353 | 35.3.4.4 | 417.61 | The BSS Parameters Change Count is not necessary for single link AP MLD. | change the text per the in comment. | Rejected-  AP MLD is capable of at least two APs. Even if it is single link AP MLD, one or more links could be added later and therefore, the BSS parameters change count is still needed. |
| 12802 | 35.3.4.4 | 417.42 | Include in this subclause also the description of the ML Reconfiguration element that can be present in beacons and probe responses, or at least point to the relevant subclause | as in comment | Revised-  Agree with the comment in principle. Apply the changes marked as #12802 in this document |
| 13352 | 35.3.4.4 | 417.42 | This is a wrong statement since an AP can carry the ciritical update other than channel switch,quiet element.This is indicated by All Updates Included field. | Change the text per the comment. | Rejected-  The sentence is correct. Only channel switch and quiet related elements are possibile to be advertised by Beacon and Probe Response frames through the Basic Multi-Link element. All Update Included field is set to 1 when only channel switch and quiet related cirtical events happen and all these elements are carried. It is not related to other critical events. |
| 11324 | 35.3.4.4 | 418.08 | The uniqueness requirement is vague. Unique among the APs affiliated with the AP MLD? Or more broadly? Also, it is not clear whehter it is the uniqueness, the advertising or both that is required. And, the lifetime statement is vague since it since it referes to multiple BSSs. | Each AP affiliated with an AP MLD has a link ID. An AP affiliated with an AP MLD shall not have the same link ID as another AP affiliated with the same AP MLD. The link ID shall not change for the lifetime of the APs BSS nor for the lifetime of any BSS of the other APs affiliated with the same AP MLD. | Revised-  Agree with the comment in principle. Apply the changes marked as #11324 in this document |
| 10231 | 35.3.4.4 | 418.08 | Problem with singular/plural agreement | Rephrase as "An AP affiliated with an AP MLD shall have a unique link ID that is advertised to the non-AP MLDs and shall not change during the lifetime of each of the BSSes that is setup by the AP MLD." | Revised-  Agree with the comment in principle. Rephrase this paragraph by taking the comment #11324 into account as well. Apply the changes marked as #10231 in this document |
| 13868 | 35.3.4.4 | 418.09 | The term Â¡Â°BSSesÂ¡+/- seems to be a typo. | It should be modified to Â¡Â°BSSÂ¡+/- | Revised-  Agree with the comment in principle. Rephrase this paragraph by taking the comment #11324 into account as well. Apply the changes marked as #13868 in this document |
| 11558 | 35.3.4.4 | 418.11 | There are also cases when the Link ID is set to the value 15 when the reporting AP does not have the information; this needs to be added for this sentence. | as in comment | Revised-  Agree with the comment in principle. NOTE 1 is added in a new section 35.3.3.1a Link ID as per the resolution of CID 10304 in DCN 22/1182r10.  Note to TGbe editor, there is no further change for this CID. |
| 14064 | 35.3.4.4 | 418.08 | The link ID rules belong to the general section of Multi-link operation | Move paragraph to 35.3.2.1 after line 13 | Revised-  Agree with the comment in principle. The corresponding paragraph was moved to a new section 35.3.3.1a Link ID as per the resolution of CID 10304 in DCN 22/1182r10.  Note to TGbe editor, there is no further change for this CID. |

**Discussion:** None.

***TGbe editor: Please modify the subclause 35.3.4.4 Multi-Link element usage rules in the context of discovery as follows***

**35.3.4.4 Multi-Link element usage rules in the context of discovery**

If an AP affiliated with an AP MLD is not in a multiple BSSID set or the AP corresponds to a transmitted BSSID in a multiple BSSID set, then the AP , in a Beacon frame and a Probe Response frame that (#10227) is not a Multi-Link probe response that it transmits (#10623),

—shall include the Multi-Link Control field and the Common Info field of the Basic Multi-Link element for the AP MLD as defined in 9.4.2.312.2 (Basic Multi-Link element) (#10624).

—shall not include the Link Info field of the Basic Multi-Link element for the AP MLD unless conditions in 35.3.11 (Multi-link procedures for channel switching, extended channel switching, and channel quieting) are satisfied. (#11556)  
—may include a Reconfiguration Multi-Link element as defined in 9.4.2.312.4 (Reconfiguration Multi-Link element) and 35.3.6 (Multi-Link reconfiguration). (#12802)

If an AP affiliated with an AP MLD corresponds to a nontransmitted BSSID in a multiple BSSID set, then the AP that corresponds to the transmitted BSSID in the same multiple BSSID set, in the nontransmitted BSSID profile corresponding to the nontransmitted BSSID in a Beacon frame and a Probe Response frame that (#10228) is not a Multi-Link probe response that it transmits (#10623) ,

—shall include the Multi-Link Control field and the Common Info field of the Basic Multi-Link element for the AP MLD as defined in 9.4.2.312.2 (Basic Multi-Link element) (#10624).

—shall not include the Link Info field of the Basic Multi-Link element for the AP MLD unless conditions in 35.3.11 (Multi-link procedures for channel switching, extended channel switching, and channel quieting) are satisfied. (#11557)

—may include a Reconfiguration Multi-Link element as defined in 9.4.2.312.4 (Reconfiguration Multi-Link element) and 35.3.6 (Multi-Link reconfiguration). (#12802)

The Common Info field of the Basic Multi-Link element carried in the Beacon frame or Probe Response frame that (#10229) is not a Multi-Link probe response, shall include the Common Info Length, the MLD MAC Address (#11415, 13354), the Link ID Info, the BSS Parameters Change Count, and the MLD Capabilities and Operations subfields, and may include the EML Capabilities subfield as defined in 35.3.18 (Enhanced multi-link multi-radio operation).

The Common Info field of the Basic Multi-Link element carried in the Beacon frame or Probe Response frame that is not a Multi-Link probe response, shall not include MLD ID subfield. (#11416)

A Probe Request frame that is not a Multi-Link probe request shall not include any variant Multi-Link element. (#)

A Multi-Link probe request shall include a Probe Request Multi-Link element and shall not include any other variant Multi-Link element (#10230, 11730, 13506).

An AP affiliated with an AP MLD shall have a unique link ID that is advertised to the non-AP MLDs and shall not change during the lifetime of each of the BSSes that are setup by the AP MLD. The Link ID field in the per-STA profile corresponding to this AP in the Multi-Link element corresponding to this AP MLD shall be set to the unique link ID value of this AP.

***TGbe editor: Please modify the subclause 35.3.3.1a Link ID in the passed CR document 22/1182r10 as shown below:***

**35.3.3.1a** **Link ID**

A link ID is a numeric value that corresponds to a tuple consisting of Operating Class, Operating Channel, and BSSID of the AP affiliated with the AP MLD. Each AP affiliated with an AP MLD has a link ID that is smaller than 15. An AP affiliated with an AP MLD shall not have the same link ID as another AP affiliated with the same AP MLD. The link ID shall not change for the lifetime of the BSS that is set up on the link associated with the link ID nor for the lifetime of any BSS of the other AP(s) affiliated with the same AP MLD. (#11324, 10231, 13868)

NOTE 1 – The Link ID subfield in Reduced Neighbor Report element is set to 15 to indicate an AP that is not affiliated with an AP MLD or if the reporting AP does not have information of the reported AP (see 9.4.2.170.2 (Neighbor AP Information field)). Therefore, an AP MLD does not assign link ID value 15 to any of its affiliated AP.

NOTE 2 – Since a link ID identifies an affiliated AP’s BSS and does not change throughout the lifetime of the BSS, the link ID remains unchanged if the AP moves its BSS to a different channel by performing channel switch procedure described in 11.8.8 (Selecting and advertising a new channel) or 11.9 (Extended channel switching). In addition, the link ID for an AP affiliated with an AP MLD is the same across all non-AP MLDs.

NOTE 3– A non-AP MLD includes the link ID obtained during discovery for identifying an affiliated AP to be requested as part of the multi-link setup with the AP MLD.

***TGbe editor: Please modify the subclause 9.4.2.312.2.2 Common Info field of the Basic Multi-Link element as follows with CID 10625***

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

The Link ID Info Present subfield is set to 0 if the Basic Multi-Link element is sent by a non-AP STA.

…

The BSS Parameters Change Count Present subfield is set to 0 if the Basic Multi-Link element is sent by a non-AP STA.

The Medium Synchronization Delay Information Present subfield is set to 0 if the Basic Multi-Link element is sent by a non-AP STA. When the Basic Multi-Link element is included in a frame sent by an AP, the condition for the presence of the Medium Synchronization Delay Information sub-field in the Common Info field is defined in 35.3.16.8 (Medium access recovery procedure). The format of the Medium Synchronization Delay Information subfield is defined in Figure 9-1002j (Medium Synchroni-zation Delay Information subfield format).

…