IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB266 – CR for CIDs related to 9.4.2.170 | | | | |
| Date: 2020-07-0 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Laurent Cariou |  |  |  | laurent.cariou@intel.com |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 13267 | 9.4.2.170.2 | 202.26 | Indicate in the text that the TBTT Information Field Type subfield can be set to 1 as well. Baseline states that value 1 is reserved. | Modify baseline text as follows: "The TBTT Information Field Type subfield identifies, together with the TBTT Information Length subfield, the format of the TBTT Information field. It is set to 0.or 1 Values 2, and 3 are reserved." | Revised – Agree with the commenter. Apply the changes marked as #13267 in this document. |
| 12965 | 9.4.2.170.2 | 202.35 | The second bullet is redundant since the next bullet already states the value/content are set as Table 9-321. Removing the second bullet can avoid changing multiple places when adding a new row in Table 9-321. | Remove the second bullet "is set to 1, 2, 5, ..." | Accept |
| 10552 | 9.4.2.170.2 | 202.42 | Since we have a different encoding of the Length field for TYPE=1, update the description text and the title of Table 9-321 to clarify that these values are valid for TYPE=0 | As in comment | Revised – agree with the commenter. Apply the changes marked as #10552 in this document. |
| 14114 | 9.4.2.170.2 | 203.47 | "If the TBTT Information Field Type subfield is 1, the TBTT Information Length subfield is set to 3, other values are reserved." | Like type 0, if length is greater than 3, the first 3 octets contains MLD parameters, for future compatibility | Revised – agree with the commenter. Modify also subclause 11.49. Apply the changes marked as #14114 in this document. |
| 13991 | 9.4.2.170.2 | 203.55 | Use capital letters T and L in type and length, respectively. | As in comment | Revised – agree with the commenter. Apply the changes marked as #13991 in this document |
| 10453 | 9.4.2.170.2 | 204.06 | The MLD ID in MLD Parameters subfield form refers to ID of AP MLD. Suggest to change to AP MLD ID to make it more clear. | in the comment | Revised – agree with the commenter.  Replace all occurrences of “MLD ID” with “AP MLD ID” in 802.11be specification. |
| 13052 | 9.4.2.170.2 | 204.17 | I don't think it is allowed that the reported AP as a nontransmitted BSSID, can affiliate with the same MLD with the reporting AP, which is also belonging to the same multiple BSSID set with the reported AP | Please make transmitted BSSID and nontransmitted BSSID shall not be belonged to the same MLD | Reject – This statement is already captured in the spec in 35.3.20 (Multi-link operation in a multiple BSSID set or co-hosted BSSID set). The sentence reads: An AP MLD shall not have more than one affiliated AP amongst APs that are members of the same multiple  BSSID set.  No further actions are needed. |
| 10553 | 9.4.2.170.2 | 204.18 | Only the TxBSSID in an MBSSID set transmits a Beacon or responds to a Probe Request frame. | Replace 'reporting AP' with "AP corresponding to transmitted BSSID". | Revised – agree with the commenter. Modify the sentence to clarify that the reporting AP is the transmitted BSSID in this context. Apply the changes marked as #10553 in this document. |
| 13462 | 9.4.2.170.2 | 204.21 | "another" is not clear. Change it to "an MLD that is neither reporting AP affilated with nor nontransmitted BSSID AP that is in same multiple BSSID set as the reporting AP affiliated with" | As in comment | Revised – agree with the commenter. Apply the changes marked as #13462 in this document |
| 10554 | 9.4.2.170.2 | 204.39 | Based on P204L39, Link ID value 15 cannot be used in Multi-Link element or FTE (see P198L14) or any Link ID bitmap. | Add normative text which states that Link ID value 15 is reserved not used in per-STA profile or FT element or any Link ID bitmap. | Revised – agree with the commenter. Apply the changes marked as #10554 in this document. |
| 10555 | 9.4.2.170.2 | 204.48 | BPCC value 255 is reserved which means the wrap around must occur when the value reached 254 (not 255) | Add normative text in 35.3.10 to states that value 255 is not used and that wrap around occurs after BPCC reaches 254. | Revised - agree with the commenter. Apply the changes marked as #10555 in this document. |
| 14023 | 9.4.2.170.2 | 204.48 | If the reported AP is not part of an AP MLD, the MLD Parameters subfiled will not be included in the TBTT Information field corresponding to that AP. | Deleter "if the reported AP is not part of an AP MLD, or". | Reject – there is a recommendation to not include MLD parameters but no mandate (case where multiple APs are in the same channel and some are part of MLD and some are not part of MLD), so the MLD parameters may be present even if the AP is not affiliated with an AP MLD. |
| 10556 | 9.4.2.170.2 | 204.52 | The All Updates Included subfield is useful only when Critical Updates Flag (CUF) subfield in the Capability Information field is 1 and BPCC of the reported AP is incremented. Otherwise this subfield is reserved (set to 0). Clarify this intention. Also, it is not clear how long this bit field will be set to 1. It should be tied to CUF=1 | As in comment | Revised – the All Updates Included is useful for all the cases where the BSS Parameters Count Change got incremented and the corresponding updates are included. Even if the CUF got set to 1 and is back to 0 after the next DTIM, if a STA of an non-AP MLD missed the beacon frame, it will check the BSS Parameters Count change fields of the APs of the associated AP MLD to see if it missed an update and if the All Updates Included is also set to 1, it will know that the updates are included. This is covered by current normative text, but propose to complement the sentence to clarify the meaning. Apply the changes marked as #10556 in this document. |
| 13463 | 9.4.2.170.2 | 204.52 | Add the text to clarify that the critical update of channel switch, quiet period is not related to All Updates Included. | As in comment | Revised – this is actually the contrary. A channel switch, quiet period inclusion is a critical update that will increment the BSS Parameters Count field and the corresponding updates will be included, so as long as the updates are included, the All Updates Included field will be set to 1. This is covered by current normative text, but propose to complement the sentence to clarify the meaning. Apply the changes marked as #13463 in this document. |
| 11385 | 9.4.2.170.2 | 205.04 | The All Updates Included subfield must be reserved when the BSS Parameters Change Count subfield in the same TBTT Information field is unchanged. In other words, the AUI subfield for a reported AP makes sense only when there is a critical update for a reported AP. | As in comment | Revised - the All Updates Included is useful for all the cases where the BSS Parameters Count Change got incremented and the corresponding updates are included. Even if the CUF got set to 1 and is back to 0 after the next DTIM, if a STA of an non-AP MLD missed the beacon frame, it will check the BSS Parameters Count change fields of the APs of the associated AP MLD to see if it missed an update and if the All Updates Included is also set to 1, it will know that the updates are included. This is covered by current normative text, but propose to complement the sentence to clarify the meaning. Apply the changes marked as #11385 in this document. |

1. **Introduction**
2. **Proposed spec text**

**9.4.2.170.2 Neighbor AP Information field**

TGbe editor: Modify the 3rd paragraph of 9.4.2.170.2 Neighbor AP Information field in REVme D1.3 ***as follows: (#13267)***

The TBTT Information Field Type subfield identifies, together with the TBTT Information Length subfield,  
the format of the TBTT Information field. It is set to 0 or 1.(#2218) Values 2, and 3 are reserved.

TGbe editor: Modify the following paragraph of 9.4.2.170.2 Neighbor AP Information field ***as follows: (#12965)***

The TBTT Information Length subfield is 1 octet in length and indicates the length of each TBTT Information field included in the TBTT Information Set field of the Neighbor AP Information field. If the TBTT Information Field Type subfield is 0, the TBTT Information Length subfield:

— contains the length in octets of each TBTT Information field that is included in the TBTT Information Set field of the Neighbor AP Information field

— indicates the TBTT Information field contents as shown in Table 9-321 (TBTT Information field contents).

TGbe editor: Modify the following paragraph of 9.4.2.170.2 Neighbor AP Information field in REVme D1.3 ***as follows: (#10552)***

The TBTT Information Length subfield is interpreted as shown in Table 9-321 (TBTT Information field  
contents) if the TBTT Information Field Type subfield is set to 0.

TGbe editor: Modify the title of Table 9-321 (TBTT Information field content ***as follows: (#10552)***

**Table 9-321—TBTT Information field contents if the TBTT Information Field Type subfield is set to 0.**

TGbe editor: Modify the following paragraph of 9.4.2.170.2 Neighbor AP Information field ***as follows: (#14114)***

If the TBTT Information Field Type subfield is 1, the TBTT Information Length subfield is set to 3, other  
values are reserved. For values higher than 3, the first 3 octets of the field contain the MLD Parameters subfield (i.e., same contents as when the length of the TBTT Information field is 3) and the remaining octets are reserved.

TGbe editor: Modify the Title of figure 9-709b ***as follows: (#13991)***

**Figure 9-709b—TBTT Information field format when the TBTT Information Field Type is equal to 1 and the TBTT Information Length is equal to 3**

TGbe editor: Modify the following paragraph of 9.4.2.170.2 Neighbor AP Information field ***as follows: (#10553)***

The MLD ID subfield indicates the identifier of the AP MLD with which the reported AP is affiliated. If the reported AP is affiliated with the same MLD as the reporting AP sending the frame carrying this element, the MLD ID subfield is set to 0. If the reported AP is affiliated with the same MLD as a nontransmitted BSSID that is in the same multiple BSSID set as the reporting AP (which corresponds to the transmitted BSSID) (#10553) sending the frame carrying this element, the MLD ID subfield is set to the same value as in the BSSID Index field in the Multiple BSSID-Index element in the nontransmitted BSSID profile corresponding to the nontransmitted BSSID. If the reported AP is affiliated with an AP MLD that is neither the AP MLD with which the reporting AP is affiliated nor an AP MLD with which a nontransmitted BSSID that is in the same multiple BSSID set as the reporting AP is affiliated (#13462), the MLD ID subfield is set to a value that is unique for this AP MLD in frames sent by the reporting AP and that is higher than 0 and lower than 255 if no Multiple BSSID element is carried in the same frame or a value higher than and lower than 255 if a Multiple BSSID element is carried in the same frame, where *n* is the value contained in the MaxBSSID Indicator field in the Multiple BSSID element. The MLD ID subfield is set to 255 if the reported AP is not part of an AP MLD, or if the reporting AP does not have information of that MLD.

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

TGbe editor: Modify the following paragraph of 35.3.4.4 Multi-Link element usage rules in the context of discovery 35.3.2.1 General ***as follows: (#10554)***

An AP affiliated with an AP MLD shall have a unique link ID that is lower than 15 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.

**35.3.10 BSS parameter critical update procedure**

TGbe editor: Modify the 2 occurrences of (modulo 256) to (modulo 255) in 35.3.10 BSS parameter critical update procedure as follows ***(#10555)***

The BSS Parameters Change Count subfield value for each AP is initialized to 0, and shall be incremented (modulo 256 excluding the value 255) when a critical update occurs to the operational parameters for that AP as defined in 11.2.3.15 (TIM Broadcast).

TGbe editor: Modify the following sentence in 35.3.10 BSS parameter critical update procedure as follows ***(#10556, #13463, #11385)***

For each reported AP affiliated with the same AP MLD as the AP, set the All Updates Included subfield in the MLD Parameters subfield in the TBTT Information field of the Reduced Neighbor Report element corresponding to the reported AP if the updated elements that correspond to the latest critical update that generated a change to the value carried in the BSS Parameters Change Count subfield for the reported AP are included in the frame carrying the Reduced Neighbor Report element, and until the updated elements are no longer included or until the BSS Parameters Change Count subfield is incremented.

TGbe editor: Modify the following sentence in 35.3.10 BSS parameter critical update procedure as follows ***(#10556, #13463, #11385)***

For each reported AP affiliated with the same AP MLD as the AP corresponding to the nontransmitted BSSID, set the All Updates Included subfield to 1 in the MLD Parameters subfield in the TBTT Information field of the Reduced Neighbor Report element corresponding to the reported AP if all the updated elements that correspond to the latest critical update that generated a change to he value carried in the BSS Parameters Change Count subfield for the reported AP are included in the frame carrying the Reduced Neighbor Report element, and until the updated elements are no longer included or until the BSS Parameters Change Count subfield is incremented, and set to 0 otherwise.

TGbe editor: add the following figure and paragraph at the end of 35.3.10 BSS parameter critical update procedure as follows ***(#10556, #13463, #11385)***



Figure xyz: An example of critical update operation

Figure xyz (An example of critical update operation) illustrates two APs affiliated with the same AP MLD. AP1 and AP2 affiliated with the AP MLD operate on Link 1 and Link 2, respectively. The figure shows the values carried in the Critical Update Flag (CUF) subfield, and the BSS Parameters Change Count (BPCC), and the All Updates Included (AUI) subfields corresponding to AP1 in the Beacon frames transmitted by AP2 when critical updates occur in AP1’s BSS. In the illustration, the value of the BPCC subfield for AP1 is equal to 5 in Beacon 21 and the CUF and AUI (corresponding to AP1) subfields are set to 0. First, a critical update that does not correspond to an element listed in 35.3.11 (Multi-link procedures for channel switching, extended channel switching, and channel quieting) is announced by AP1 in Beacon 12, which causes the BPCC (for AP1) to increment by one (to 6) in Beacon 22. Also, in Beacon 22 AP2 sets the CUF subfield to 1. The AUI subfield (corresponding to AP1) is set to 0 since the element corresponding to the latest critical update is not included in Beacon 22. Next, in Beacon 13, AP1 includes a Quiet element to advertise a quiet interval, which results in the BPCC (for AP1) to be incremented by one (to 7). Since this critical update corresponds to an element listed in 35.3.11 (Multi-link procedures for channel switching, extended channel switching, and channel quieting), AP2 includes the Quiet element in the per-STA profile corresponding to AP1 in Beacon 23 and sets the CUF and AUI (corresponding to AP1) subfields to 1 and 1, respectively. The CUF subfield is set to 1 until the next DTIM Beacon of AP2 (i.e., until Beacon 25). The AUI subfield corresponding to AP1 is set to 1 in Beacons 24, 25 and 26 since these Beacon frames include the element corresponding to the last critical update. Finally, a critical update, not corresponding to elements listed in 35.3.11 (Multi-link procedures for channel switching, extended channel switching, and channel quieting) is announced by AP1 in Beacons 17, which causes AP1’s BPCC to increment by one (to 8). Although Quiet element is still included in the per-STA profile corresponding to AP1 in Beacons 27 and 28, the element corresponding to the latest critical update is not included in these Beacon frames. Consequently, the AUI subfield corresponding to AP1 in Beacons 27 and 28 are set to 0.

TGbe editor: Modify the following paragraph of 11.49 Reduced neighbor report ***as follows: (#14114)***

**11.49 Reduced neighbor report**

***Change the last paragraph as follows:***

A STA that receives a Neighbor AP Information field with a recognized TBTT Information Field Type subfield set to 0 but an unrecognized TBTT Information Length subfield ~~shall ignore that Neighbor AP Information~~ ~~field and continue to process remaining Neighbor AP Information fields.~~ has ~~two~~three possible ways of processing the received information: (1) ignore that Neighbor AP Information field and continue to process the subsequent Neighbor AP Information fields or (2) process the first 13 octets of each TBTT Information field of the Neighbor AP Information field as if the TBTT Information Length subfield had value 13, ignore the remaining TBTT Information Length minus 13 octets of each TBTT Information field of the Neighbor AP Information field, and continue to process the subsequent Neighbor AP Information fields or (3) process the first 16 octets of each TBTT Information field of the Neighbor AP Information field as if the TBTT Information Length subfield had value 16, ignore the remaining TBTT Information Length minus 16 octets of each TBTT Information field of the Neighbor AP Information field, and continue to process the subsequent Neighbor AP Information fields. If the unrecognized TBTT Information Length value is less than or equal to 13, the STA shall follow alternative (1). If the unrecognized TBTT Information Length value is greater than 13, an HE STA shall follow alternative (2) and a non-HE STA shall follow either alternative (1) or (2). If the unrecognized TBTT information length value is greater than 16, an EHT STA shall follow alternative (3) and a non-EHT STA shall follow either alternative (1) or (2) or (3).

A STA that receives a Neighbor AP Information field with a recognized TBTT Information Field Type subfield set to 1 but an unrecognized TBTT Information Length subfield that is set to a value larger than 3 shall process the first 3 octets of each TBTT Information field of the Neighbor AP Information field as if the TBTT Information Length subfield had value 3, ignore the remaining TBTT Information Length minus 3 octets of each TBTT Information field of the Neighbor AP Information field, and continue to process the subsequent Neighbor AP Information fields.