IEEE P802.11
Wireless LANs

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| LB275 – CR for misc CIDs |
| Date: 2023-09-07 |
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Abstract

Spec text proposal for resolution of following CIDs for LB275 on 11be D4.0:

19423 20119 19663 19364 19900 19741 19743 19604 19365 19411 20091 19466 19463 19438 19377 19378 19670 19321 19912 19913 19472 19914 19650 19660 19239 19916 19917 19240 19918 19919 19188 19923 19328 19941 19684 19599 19943 19159 19527 19600 19771 19173 19615 19652 19656 19685 20072 20038 20124 20089 19686 19252 20039 19105 19253 19323 20040 19262 19078 19325 19951 20049 19263 19217 20093 19373 20094 20058 19274 19278 19279 19280 19281 19282 19795 19300 19301 19796 19797 19799

20119 19663 19900 19743 19604 19365 19377 19378 19670 19321 19912 19913 19472 19650 19660 19239 19916 19917 19240 19918 19919 19923 19328 19941 19684 19599 19943 19252 20039 19105 19253 19323 20040 19262 19078 19325 19951 20049 19263 20093 20094 20058 19274 19278 19279 19280 19281 19282 19795 19300 19301 19797 19799

R6: 20123 19466 19463 19438 19741

R7:

Reject or no changes 19423 19411 19914 19159 19527 19600 19771 19173 19615 19652 19656 19685 20072 20038 20124 20089 19796

New resolution 19188 19373

Others 19217

Missing 19628(Yanjun) 19798(Arik) 20121(Gaurang)

1. **Introduction**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 19423 | Guogang Huang | 9.6.13.9 | 0.00 | Considering the BTM Request frame can be used for both the link removal and link disablement, a Link Disablement Imminent subfield should be added to distinguish these two cases. In this case, suggest to combine Link Removal Imminent and Link Disablement Imminent subfields into an Operation Type subfield. | As in comment. |  Reject – these 2 fields have exactly the same behavior (indicate to non-AP MLD that they can ignore the BTM request. We can therefore define everything with a single bit. If the group prefers to use 2 bits, that means it doesn’t care about optimizing the bit-consumption optimization and would therefore not be interested in the proposal from the commenter. |
| 20119 | Gaurang Naik | 34 | 0.00 | Wrong reference. The statement must refer to 35.3.11. Same comment throughout the example. | Change 35.11 to 35.3.11 |  Revised – agree with the commenter. Change all references to “35.11 (Rules related to the PHY interface of an EHT STA)” with the reference to “35.3.11 Multi-link procedures for (extended) channel switching and channel quieting” in Subclause AF.6 Example of critical update operation |
| 19663 | Laurent Cariou | 9.3.3.9 | 189.17 | "Except if the STA is an EHT STA" is a bit uncliear. Replace with something like: Except if the STA is an EHT STA, in which case the EHT STA follows the rules in 35.3.4.5. | as in comment |  Revised – agree with the comment. Apply the changes marked as #19663 in this document |
| 19364 | Brian Hart | 9.4.2.5.1 | 214.01 | As expressed, we have conditions for all STAs using APSD and no STAs using APSD, but no conditions if APSD is used on some links but not other links (mixed usage). This is badly written but works if APSD is an MLD level protocol but that doesn't seem to be the case, since P546L12 etc imply APSD is a per-link agreement not a per-MLD agreement. Or, this is incomplete if APSD is a per-link agreement | a) Define clearly in clause 35 if APSD is per link or per MLD agreement (or per link but all links have to match up!), b) if per link and mixed is possible, then extend this to account for the mixed usage case, c) if at MLD level, then rewrite for MLD not "all STAs affiliated ..." d) if per link and mixed is disallowed, add that language and a link to it. |   |
| 19900 | Liwen Chu | 9.4.2.35 | 222.61 | It seems not possible that the fields of Basic ML element in the Neighbor Report is same as the fields of Basic ML element in the Beacon frame. One excmaple is the AP MLD MAC address. | As in comment. |  Revised – agree with the commenter. Reporting AP should be AP. Apply the changes marked as #19900 in this document. |
| 19741 | Abhishek Patil | 9.4.2.44 | 224.04 | The values carried in the the fields of RNR IE (except for the ones listed in the NOTE) apply to all BSSIDs in the multiple BSSID set regardless of whether the RNR IE is carried in the same frame as Multiple BSSID element. | Replace "When present in thea frame that carries the Multiple BSSID element, the" with "The". | Revised – Replace Note 5 with the following: A Reduced Neighbor Report element is not carried in the Nontransmitted BSSID Profile subelement and contains information relevant for all the BSSs in the multiple BSSID set. See 9.4.2.169.2 (Neighbor AP Information field) for the fields setting (especially the Same SSID and the AP MLD ID fields) when the Reduced Neighbor Report element is included in a frame sent by a transmitted BSSID.. |
| 19743 | Abhishek Patil | 9.4.2.169.2 | 231.63 | The contents of this paragraph are severely limiting the usage of TBTT Information Field Type set to 1. The TBTT Information Length field can be set to values other than 3 and can represent another field or a combination of fields when value is other than 3. For example, TGbc has defined type=1 and length=2 (which does not conflict with TGbe's usage of type=1, length=3). Merge the sentences in this paragraph while deleting the limiting content about other length values. | Replace the text in the paragraph with the following text: "If the TBTT Information Field Type subfield is to 1 and the TBTT Information Length subfield is set to 3, then the TBTT Information field carries the MLD Parameters subfield." |  Revised - Replace the text in the paragraph with the following text: "If the TBTT Information Field Type subfield is set to 1 and the TBTT Information Length subfield is set to 3, then the TBTT Information field carries the MLD Parameters subfield." |
| 19604 | Hanqing Lou | 9.4.2.169.2 | 231.65 | Based on the first sentence, values higher than 3 are reserved at least for 11be device. A reserved value doesn't mean the present of the MLD Parameter field. So it controdicts with the second sentence. | Remove the sentence "For values higher than 3, the first 3 octets of the field contain the MLD Parameters sub-field (i.e., same contents as when the length of the TBTT Information field is 3) and the remaining octets are reserved." or state clearly for value N (N is greater than 3), it means N octets TBTT Information field present and the first 3 octet is the MLD Parameters field. For 11be STAs, the 4 to N octets are reserved. |  Reject – this is similar to what is done for type 0. The proposed change doesn’t seem to provide more clarity and is therefore not needed. |
| 19365 | Brian Hart | 9.4.2.169.2 | 232.57 | Note implies a strong rule but provides no normative xref, and is incorrect if MaxBSSIDIndicator in Multiple BSSID element is 8 and the BSSID Index field in the Multiple BSSID-Index element in the nontransmitted BSSID profile corresponding to the nontransmitted BSSID happens to be 255. | Add normative text disallowing the BSSID Index field in the Multiple BSSID-Index element in a nontransmitted BSSID profile sent by an EHT AP to be 255. Add a xref to this in the note. |  Reject – Normative text is already present in another subclause: “APaffiliated with an AP MLD shall not have a BSSID index set to 255” (p499l59). |
| 19411 | Guogang Huang | 9 | 233.13 | For the link disablement, considering each affiliated AP except the affiliated AP which is disabled shall advisetise a T2L Mapping element to signal the link disablement, the sole purpose to add a Disabled Link Indication subfield in the RNR element is to prohibit the unassociated AP MLD to probe this disabled AP. If the above claim holds, we also should find a method to probihit the legacy STA to probe this disabled AP. Because the legacy STA cannot recognize the Disabled Link Indication subfield | For a reported AP which is disabled, set the TBTT Info Field Type and TBTT Info Field Length subfields to 1 and 3, respecitively. And only the MLD Parameters subfield is included. Thus the legacy STA will ignore this reported AP info |  Reject – this issue has been discussed at length and the proposal never reached majority support. The likely reason for it is that the problem is not strong as there are no real issues if some legacy STAs send a probe in the disabled link. What will simply happen is that there will be no response. |
| 19466 | Bo Gong | 9.6.13.8 | 307.06 | If an AP MLD is recommended in the BTM Transition Candidate List Entries field with a subset of APs, should non-AP stations affiliated with the non-AP MLD associate with APs affiliated with the same AP MLD as the the subset of the APs in the list but outside of the indicated subset of APs. For example, if AP MLD 1 that has 4 affiliated APs is recommended in the list with AP1, AP2, and AP4, should non-AP MLD associate with AP3? It is not clear as per the current context. | Add the necessary details on how to deal with the affiliated APs not listed in a recommeded AP subset. Clarify the treatment of an affiliated AP not shown in any subset of the corresponding AP MLD which is presented in the BSS Transition Candidate List Entries field. |  Revised – agree with the commenter. Apply the changes marked as #19466 in this document |
| 19463 | Mengshi Hu | 9.6.13.8 | 307.07 | When recommending a subset of APs of a AP MLD is allowed, the AP's attitude towards the complement set of the recommended subset should be clear (whether it is "preference 0" or "not recommend or against to") for integrity. | Just like the Abridged bit, the recommending AP MLD should make clear its attitude towards ALL APs affiliated with a recommended AP MLD of which a specific AP subset is included in the Neighbor Report element, no matter they are listed in the subset or not. | Revised – agree with the commenter. Apply the changes marked as #19463 in this document |
| 19438 | Guogang Huang | 9.6.13.8 | 307.10 | Currently, there is indication on how to treat APs or AP MLDs not presented in the BTM Candidate list. However, there is no indication on how to treat unpresented APs in a presented AP subset. | Point out how to treat unpresented affiliated APs in a presented AP subset in the candidate list. |  Revised – agree with the commenter. Apply the changes marked as #19438 in this document |
| 19377 | Brian Hart | 9.6.13.9 | 307.29 | Probably unintendedly ambiguous antecedent (It => "AP MLD") | Try "..., the BSS Termination Included indicates ..." ditto L31.5, L36, L40 | Revised – change to "..., the BSS Termination Included field indicates ..." ditto L31.5, L36, L40 |
| 19378 | Brian Hart | 9.6.13.9 | 307.54 | Probably unintendedly ambiguous antecedent (It => "one affiliated AP") | Change "it" to "the AP MLD" at L57. Similarly, change "it" at L58.5 to "the receiving STA" |  Accept |
| 19670 | Arik Klein | 9.6.13.9 | 308.10 | The paragraph that starts with "The Link Removal Imminent (bit 5) field is reserved if one of the following conditions is met:" should be indented as all the preceding sub-paragraphs of the fifth paragraph (which describes the fields of the Request Mode field) | Please indent the entire paragraph (with all its sub-bullets), using the "-" sign for marking it as a sub-paragraph. |  Reject – this paragraph falls into the subbullet 6 and is not meant to be a 7th subbullet. |
| 19321 | Henry Ptasinski | 35.3.23 | 36.77 | The handling of a the Neighbor Report that describes a preference for a target BSS candidate needs to be specified. If the receiving non-AP STA transitions to the BSS candidate, what happens to the MLD with which the non-AP STA is affiliated, and to all the other affiliated non-AP STAs? Is dot11MultiLinkActivated set to false for all the STAs, and all the STSa except the recipient disassociate from the ESS? What happens to the existing security association (which is between the MLDs)? | Add a requirement that, if the STA transitions from an AP MLD to a non-AP BSS in the same ESS, then all affiliated STAs set dot11MultiLinkActivated to false and disassociate from the ESS, any related MLD security state is cleared, and the STA performing the transition must establish a new security association. |  Reject –that the omment is asking a question.The answer is that there can be fast BSS transition between an AP MLD and an AP.  |
| 19912 | Rubayet Shafin | 35.3.4.1 | 499.16 | spurious comma after the paranthesis | delete the comma |  accept |
| 19913 | Rubayet Shafin | 35.3.4.1 | 499.25 | It should be "for each of the APs" | delete "other" |  Reject – the AP that correpsonds to the nontransmitted BSSID is not included. |
| 19472 | Stephen McCann | 35.3.4.1 | 499.32 | typo "if all the" | Change "if all the" to "if all of the" |  Accept |
| 19914 | Rubayet Shafin | 35.3.4.1 | 499.37 | No need to exclude the case where one or more APs in the co-located AP set is operating on the same channel as the reporting AP. | Relax the condition of the second bullet |  Reject – when that is the case, then the previous paragraph already ensure that the information is carried. This paragraph is only for a very specific case that is described, for clarity with multiple sub-bullets. |
| 19650 | Massinissa Lalam | 35.3.4.1 | 499.47 | Missing a "with" in "then each AP affiliated the other AP MLD (AP MLD 2)". It should read "then each AP affiliated with the other AP MLD (AP MLD 2)" | As in comment |  accept |
| 19660 | Laurent Cariou | 35.3.4.2 | 500.44 | This paragraph is still very difficult to parse and this will likely lead to interop issues. | Clarify for each addressing case if the MLD ID is included and how it is set if included. |  Agree with the commenter. Apply the changes marked as #19660 in this document. |
| 19239 | John Wullert | 35.3.4.2 | 500.52 | In this case, "any" should be followed by a plural noun | Replace "any per-STA profile" with "any per-STA profiles" |  Accept |
| 19916 | Rubayet Shafin | 35.3.4.2 | 501.01 | This paragraph only enables requesting same set of elements for all the requested APs. Better to also enable requesting different sets of elements for different requested APs (this is because the non-AP MLD can have different sets of capabilities for different links and accordingly may need different sets of information from the AP MLD for those links). | as in comment. |  Reject – this is already covered in the description. |
| 19917 | Rubayet Shafin | 35.3.4 | 501.06 | clarify that the AP to which the ml probe request is sent is also affiliated with the same AP MLD as the requested AP. | as in comment. | Revised – clarify the intent of the sentences. Apply the changes marked as #19917 in this document. |
| 19240 | John Wullert | 35.3.4.2 | 502.13 | Duplicate use of "only" | Replace "A multi-link probe request can only solicit information of only one AP MLD..." with "A multi-link probe request can only solicit information for one AP MLD..." |  Accept |
| 19918 | Rubayet Shafin | 35.3.4.2 | 502.17 | complete profile for an "MLD" is not defined. Complete profile is with respect to a STA affiliated with an MLD (see 35.3.3.3). | Please revise the first part of the sentence. |  Revised – Agree with the commenter. Actually the Note 4 doesn’t bring anything on top of Note 3. Instruct the editor to delete Note 4 page 502 linke 17. |
| 19919 | Rubayet Shafin | 35.3.4.2 | 502.22 | double "with" | delete the with after the "affiliated" |  Accept |
| 19188 | Matthew Fischer | 35.3.4.2 | 502.27 | With reference to NOTE 7 here and the complementary note in the next subclause for the non-AP MLD, the second note does not say how the non-AP MLD knows that the information is incomplete when the request was for "all" and I wonder if the non-AP knows what is missing to create a second request. | Include in the note how the non-AP MLD knows that the information is incomplete and what the recourse is in that case. |   |
| 19923 | Rubayet Shafin | 35.3.4.5 | 504.14 | How would a legacy AP react to this omission of elements? This need to be clarified. | as in comment. |  Reject – that is why this is a may and not a shall. We don’t describe in UHR the behavior of legacy APs.  |
| 19328 | Ryuichi Hirata | 35.3.7 | 519.43 | For Multi-link load balancing, information of other links such as link utilization, number of STAs, link availability should be indicated in A-Control field. | as in the comment. |  Reject – there has been several attempts to propose to add more information for enhanced load balancing. That was judged by the group as not needed. |
| 19941 | Rubayet Shafin | 35.3.7.2 | 520.01 | At the title of the clause, it would be good to supply the abbreviation for TTLM for completeness. | as in comment. |  Revised – agree with the commenter. Apply the changes marked as #19941 in this document |
| 19684 | Arik Klein | 35.3.7.2.1 | 520.11 | The current (very long) sentence is unclear with the requirement for the non-AP MLD to support the TID-To-Link mapping:" A non-AP MLD that performs multi-link (re)setup on at least two links with an AP MLD that sets the TID-To-Link Mapping Negotiation Support subfield of the MLD Capabilities field of the Basic Multi-Link element to a nonzero value shall support TID-to-link mapping negotiation with the TID-To-Link Mapping Negotiation Support subfield of the MLD Capabilities field of the Basic Multi-Link element it transmits to at least 1". Please revise as suggested. | Consider revising the sentence as follows:" A non-AP MLD that performs multi-link (re)setup on at least two links with an AP MLD that sets the TID-To-Link Mapping Negotiation Support subfield of the MLD Capabilities field of the Basic Multi-Link element to a nonzero value, shall support TID-to-link mapping negotiation \*by setting\* the TID-To-Link Mapping Negotiation Support subfield of the MLD Capabilities field of the Basic Multi-Link element it transmits to \*a minimal value of 1, at least\*." |  Revised – Change the sentence to: A non-AP MLD that performs multi-link (re)setup on at least two links with an AP MLD that sets the TID-To-Link Mapping Negotiation Support subfield of the MLD Capabilities field of the Basic Multi-Link element to a nonzero value, shall support TID-to-link mapping negotiation by setting the TID-To-Link Mapping Negotiation Support subfield of the MLD Capabilities field of the Basic Multi-Link element it transmits to a nonzero value." |
| 19599 | Hanqing Lou | 35.3.7.2.1 | 520.13 | TTLM Negotiation Support subfield set to 2 is reserved. In general a reserved value doesn't mean it supports TTLM negotiation or not. | change 'to a nonzero value' to 'to 1 or 3' | Reject – nonzero value is clear enough. |
| 19943 | Rubayet Shafin | 35.3.7.2.1 | 520.14 | "MLD Capabilities"--> "MLD Capabilities And Operations". | Make the correction through several places in this clause |  Accept |
| 19159 | Yoshio Urabe | 35.3.7.2.1 | 520.15 | A "dot11EHTBaseLineFeaturesImplementedOnly" still remains. | delete "with dot11EHTBaseLineFeaturesImplementedOnly equal to true " |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19527 | Sigurd Schelstraete | 35.3.7.2.1 | 520.15 | Use of "dot11EHTBaseLineFeaturesImplementedOnly". I thought this had been removed. This is in fact the only occurrence in the draft. | Rephrase requirement without use of "dot11EHTBaseLineFeaturesImplementedOnly" |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19600 | Hanqing Lou | 35.3.7.2.1 | 520.15 | "dot11EHTBaseLineFeaturesImplementedOnly" is not used anymore | Remove the sentence |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19771 | Abhishek Patil | 35.3.7.2.1 | 520.15 | This MIB variable was removed from the TGbe spec during a previous LB. Please update the sentence to remove reference to the MIB variable. | As in comment |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19173 | Rojan Chitrakar | 35.3.7.2.1 | 520.16 | "An MLD with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of the Basic Multi-Link element to 3."dot11EHTBaseLineFeaturesImplementedOnly doesn't exist. | Change the sentence as:"An MLD shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of the Basic Multi-Link element to 3." |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19615 | Mark Hamilton | 35.3.7.2.1 | 520.16 | dot11EHTBaseLineFeaturesImplementedOnly - no such MIB attribute | Re-write this sentence with an appropriate condition. |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19652 | Massinissa Lalam | 35.3.7.2.1 | 520.16 | dot11EHTBaseLineFeaturesImplementedOnly is no more defined. Delete the sentence ". An MLD with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of the Basic Multi-Link element to 3." | As in comment |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19656 | Yongho Seok | 35.3.7.2.1 | 520.16 | "An MLD with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of the Basic Multi-Link element to 3."Since the dot11EHTBaseLineFeaturesImplementedOnly does not exist in the current draft and the TTLM negotiation mode 3 is an optional feature, remove this sentence. | Remove the following sentence:"An MLD with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of the Basic Multi-Link element to 3." |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 19685 | Arik Klein | 35.3.7.2.1 | 520.16 | The dot11EHTBaseLineFeaturesImplementedOnly MIB attribute is deprecated from the specification. Please remove the following sentence "An MLD with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of theBasic Multi-Link element to 3." | As in comment |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 20072 | Li-Hsiang Sun | 35.3.7.2.1 | 520.16 | "An MLD with dot11EHTBaseLineFeaturesImplementedOnly equal totrue shall not set the TID-To-Link Mapping Negotiation Support subfield of MLD Capabilities field of theBasic Multi-Link element to 3."However dot11EHTBaseLineFeaturesImplementedOnly is not defined | remove the sentence, or remove " with dot11EHTBaseLineFeaturesImplementedOnly equal to true" |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 20038 | Binita Gupta | ï»¿35.3.7.2.1 | 520.19 | TTLM Mode 2 is important for prioritizing QoS traffic by enabling mapping of a subset of TIDs carrying QoS traffic with high performance requirements to a link set. | Add procedures related to TTLM Mode 2 here and in other TTLM clauses. Commenter will bring a contribution. |  Reject – this has been proposed in the past with document 22/1510r4 and failed to reach consensus. There are many implications in designing such a mode that need to be carefully thought through. Continuing to push this at this stage is not helping the convergence on the maturity of the specification. |
| 20124 | Gaurang Naik | 15 | 520.35 | Lingering MIB variable that was deleted in D3.0. Update the statement. | As in comment. |  Revised – attempts to remove mode 3 in LB271 failed. Keeping in the spec a mode that was agreed to be defined in 11be seems right. Remove the sentence. Apply the changes marked as #19159 |
| 20089 | Liuming Lu | 35.3.7.2.1 General | 520.37 | The inconsistency between unreachability and enablement for a setup link of non-AP MLD needs to be clarified. If an AP affiliated with the AP MLD is unreachable to an non-AP STA affiliated with an associated non-AP MLD corresponding to a setup link, it may be beneficial to set that link to be disabled for the non-AP MLD. | Please clarify how to handle the inconsistency between unreachability and enablement for a setup link of non-AP MLD. |  Reject – there is nothing in the specification about unreachability of a link, so no inconsistency. |
| 19686 | Arik Klein | 35.3.7.2.1 | 520.40 | The term "MPDU with TIDs" (mentioned in P520L40) may correspond also to "QoS Null frames".Thus, there is a conflict between the requirement in P520L40 to send the MPDUs only on the links that are mapped to the TIDs of these MPDUs and the requirement in P520L44 which allows the QoS Null frames to be transmitted on any enabled link | Replace the term "MPDUs with TIDs mapped to that link" with "Data frames with TIDs mapped to that link". |  Revised – agree with the commenter. Apply the changes marked as #19686 in this document. |
| 19252 | John Wullert | 35.3.7.2.1 | 521.01 | NOTE 1 refers to "suspension of wireless functionalities" while the terminology in the prior paragraph is "suspend operations". Operations appears to be a better term, because not all the activities mentioned in the NOTE are specifically wireless. | Revise NOTE 1 text to say "Suspension of operations refers to functionalities..." |  Accept |
| 20039 | Binita Gupta | ï»¿35.3.7.2.1 | 521.01 | Revise NOTE 1 to '"Suspension of operations on a disabled link refers to suspending operations such as frame generation,...", since term \*wireless functionalities\* is not used in the previous para. | Revise NOTE 1 as per comment |  Revised – agree with the commenter. Apply the changes as proposed in CID19252 |
| 19105 | Kazuto Yano | 35.3.7.2.1 | 521.62 | "and" must be "an". | Please fix this typo. |  Accept |
| 19253 | John Wullert | 35.3.7.2.1 | 521.62 | Typo: "The use of More Data subfield by and MLD for the different possible..." should be "The use of More Data subfield by an MLD for the different possible..." | As in comment |  Accept |
| 19323 | Atsushi Shirakawa | 35.3.7.2.1 | 521.62 | Typo: "by and MLD" should be "by an MLD" ? | As in comment. |  Accept |
| 20040 | Binita Gupta | ï»¿35.3.7.2.1 | 521.62 | Typo 'and' -> 'an' | As per comment |  Accept |
| 19262 | John Wullert | 35.3.7.3 | 527.04 | The word "signal" should be "single" in the text "An example of link transition operation by a signal radio non-AP MLD using power states is shown..." | As in comment |  Accept |
| 19078 | Pei Zhou | 35.3.7.3 | 527.05 | This example is related to single radio non-AP MLD. | Change "signal" to "single". |  Accept |
| 19325 | Atsushi Shirakawa | 35.3.7.3 | 527.05 | Typo: "signal radio non-AP MLD" should be "single radio non-AP MLD" ? | As in comment. |  Accept |
| 19951 | Rubayet Shafin | 35.3.7.3 | 527.05 | Typo:change "signal" to "single" | as in comment. |  Accept |
| 20049 | Binita Gupta | ï»¿35.3.7.3 | 527.05 | Typo: change \*signal\* to \*single\* | As per comment |  Accept |
| 19263 | John Wullert | 35.3.7.3 | 527.31 | The text "following the rules defined in 35.3.7.2.1 (General)" does not provide any indication to the reader as to what rules are being referred to. | Change text to "following the TTLM rules defined in 35.3.7.2.1 (General)." Also, make same change on page 527, line 43. |  Accept |
| 19217 | Sanghyun Kim | 35.3.11 | 537.01 | In D4.0, it is constrained that the operating channels of two setup links should not overlap (35.3.5 ML (re) setup). Therefore, when the AP MLD changes the operating channels of a specific link, it will need to consider whether the newly operating channel overlaps with the operating channel of another setup link where its associated non-AP MLD is operating on. | Rules for selecting a new operating channel should be provided for the AP MLD |  Revised – agree with the commenter. Add the related rule. Apply the changes marked as #19217 in this document. |
| 20093 | kaiying Lu | 35.3.11 | 538.36 | Note 5 should be moved to the place immediately before Note 6. | As in comment. |  Accept |
| 19373 | Brian Hart | 35.3.11 | 538.47 | It is hard for an AP to switch to a DFS channel without disrupting assoc clients because of the long CAC. Option 1) Quiet element on serving channel during CAC then CSA/ECSA with short MCST after DFS channel is proven to be clear. If first/second/third/... DFS channels checked holds radar then multiple Quiet intervals before CSA/ECSA. CSA/ECSA is only used when new DFS channel is known.Option 2) AP sends CSA/ECSA up front. But if checked channel has radar, clients are left hanging; AP now has to check a new channel and somehow report that new channel (if & when the check is successful) to the clients, perhaps via other APs in the AP MLD. But the language here seems to prohibit that: "the Channel Switch Announcement element and the Extended Channel Switch Announcement element shall not be included in the per-STA profile of the affected AP in the Beacon and Probe Response frames" | 1) Add explanation for these two options. 2) In the second option, if the RNR can help point to the planned new channel, then describe that. Otherwise, remove the restriction at P533L16 | Reject – this problem is a general problem of channel switch. Section 35.3.11 doesn’t change the channel switch mechanism, it only defines operation for signaling on all links the same information that is providing for channel switch on the link that will be switched.Option 1 seems to be possible today without spec text changes.  |
| 20094 | kaiying Lu | 35.3.11 | 538.51 | Change to "The value carried in the Switch Time field in the Max Channel Switch Time element indicates the adjusted estimated time of the first Beacon frame transmitted on the new channel of the affected link after the channel switch has occurred." And delete the second sentence of Note 5, because it is duplicated. | As in comment. |  Accept |
| 20058 | Binita Gupta | ï»¿35.3.11 | 539.57 | Move the example in Figure 35-8 to Annex AF, to be consistent with where examples are captured in the spec. | As per comment. |  Revised – Instruct the editor to: (1) move the Figure 35-8 and related description to the end of subclause AF7, (2) Change Title of AF7 by changing “information a link” to “information of a link”, (3) apply the changes marked as #20058 in this document |
| 19274 | John Wullert | 35.3.11 | 540.32 | The phrase "if any" does not seem to serve any purpose here and "wake up" is the correct verb form. | Rephrase as "...makes it possible for a non-AP MLD that is monitoring only another link and is in the doze state and scheduled to wake up to receive..." |  Accept |
| 19278 | John Wullert | 35.3.12.9 | 546.49 | The phrase "by one of its affiliated AP" should be "by one of its affiliated APs" | As in comment |  Accept |
| 19279 | John Wullert | 35.3.12.9 | 546.53 | The use of "and with" does not make clear the relationship between the clauses | Rephrase as "correspond only to Data frames for the non-AP MLD that have TIDs mapped to this link..." |  Accept |
| 19280 | John Wullert | 35.3.12.9 | 547.04 | The phrase "one of any non-AP STA" should be "one of any non-AP STAs" | As in comment |  Accept |
| 19281 | John Wullert | 35.3.12.9 | 547.14 | After clarifying that the link in question is referred to as the "receiving link", it would be clearer to use that terminology | Rephrase as "...with the More Data subfield set to 1 on a link (receiving link), then at least one of any non-AP STA that is affiliated with the non-AP MLD, that is in PS mode and that is operating on the receiving link or another link to which any of the TIDs that is mapped to the receiving link is also mapped shall..." |  Accept |
| 19282 | John Wullert | 35.3.12.9 | 547.20 | The phase "buffered BUs buffered" is a bit redundant | Rephrase as "retrieve the BUs buffered at the AP MLD" |  Accept |
| 19795 | Abhishek Patil | 35.3.23 | 577.27 | The sentence is missing a 'then' due to which the consequence of the condition is not clear. Also, replace the 'it' with Neighbor Report element on the 3rd line so that it is clear that the condition applies to the NR IE not the frame. | Replace ", it describes the ..." with ", then the Neighbor Report element describes the ..." |  Accept |
| 19300 | John Wullert | 35.3.23 | 577.28 | Stray close parenthesis mark | Remove the mark |  Accept |
| 19301 | John Wullert | 35.3.23 | 577.29 | Title of clause 11.21.7 is "BSS transition management". The final words "for network load balancing" should be removed. | As in comment |  Accept |
| 19796 | Abhishek Patil | 35.3.23 | 577.44 | Can a non-AP MLD request ML setup with the recommended AP MLD for larger set of links than what is specified in the BTM Request but request via T2LM IE in the (Re)Association Request frame the link set matching the one in the BTM Request? This should be allowed. Please clarify. | As in comment |  Reject – everything is possible. It’s a recommendation. No action needs to be taken for this CID. |
| 19797 | Abhishek Patil | 35.3.23 | 577.61 | The second sentence (in the last bullet on page 577) doesn't add much value. An AP MLD may or may not set the Preference field to the same value. The main ideas is that an AP MLD is allowed to advertise more than NR IE only if the recommended subset of affiliated APs is different. This is covered by the first sentence. | Delete the second sentence. |  Reject – Not a strong view on this, but the sentence does clarify that it is possible to include 2 subsets with different preferences. |
| 19798 | Abhishek Patil | 35.3.23 | 578.15 | Since Link Removal Imminent subfield also covers the case of link disablement, please rename the field to capture it. | Rename the "Link Removal Imminent" field to "Link Removal or Disablement Imminent" |  Reject  |
| 19799 | Abhishek Patil | 35.3.23 | 578.17 | The note captures several important aspect and should be converted to normative text. In addition to T2LM, the non-AP MLD has the option to perform ML reconfiguration 1:1 add or remove operation to match the AP MLD's recommended link set. | Convert the NOTE to normative text and provide each option as a separate bullet. |  Revised – agree with the commenter. Apply the changes marked as #19799 in this document. |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 20123 | Gaurang Naik | 35.3.23 | 578.35 | This NOTE is specifying normative behavior. So, it should be written as normative text. | As in comment | Revised – agree with the commenter. Apply the changes marked as #19799 |

1. **Proposed spec text**
	* + 1. **Probe Request frame format**

Tgbe editor: Modify the following table 9-66 as follows(#19963):

**Table 9-66—Probe Request frame body**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| … |  |  |
| 6 | Supported Operating Classes | The Supported Operating Classes element is present if dot11Ex- tendedChannelSwitchActivated or dot11OperatingClassesRe- quired is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA).The Supported Operating Classes element is optionally present if dot11TVHTOptionImplemented is true. |
| 7 | HT Capabilities | The HT Capabilities element is present when dot11HighThroughputOptionImplemented is true and the STA is not a STA 6G, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| 8 | 20/40 BSSCoexistence | The 20/40 BSS Coexistence element is optionally present when dot112040BSSCoexistenceManagementSupport is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame con- tent for a non-AP EHT STA). |
| 9 | Extended Capabilities | The Extended Capabilities element is present if any of the fields in this element are nonzero, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| 10 | SSID List | The SSID List element is optionally present if dot11SSIDListAc- tivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| 11 | Channel Usage | The Channel Usage element is optionally present if dot11Chan- nelUsageActivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| 12 | Interworking | The Interworking element is present if dot11InterworkingService- Activated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| … |  |  |
| 17 | VHT Capabilities | The VHT Capabilities element is present when dot11VHTOption- Implemented is true and the STA is not a STA 6G, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| 18 | Estimated Service Parameters Inbound | The Estimated Service Parameters Inbound element is optionally present if dot11EstimatedServiceParametersInboundOptionImple- mented is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| … |  |  |
| 20 | FILS Request Parameters | The FILS Request Parameters element is optionally present if dot11FILSActivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA); otherwise, not present. |

**Table 9-66—Probe Request frame body *(continued)***

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 21 | AP-CSN | The AP-CSN element is optionally present if dot11FILSActivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA); otherwise, not present. |
| … |  |  |
| 30 | Cluster Probe | The Cluster Probe element is optionally present if dot11Clusterin- gActivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA); other- wise, not present. |
| … |  |  |
| 32 | Estimated Service Parameters Outbound | The Estimated Service Parameters Outbound element is optionally present if dot11EstimatedServiceParametersOutboundOptionIm- plemented is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| 33 | Supplemental Class 2 Capabilities | The Supplemental Class 2 Capabilities element is present when dot11Class2CapabilitiesOptionImplemented is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA); otherwise, not present. |
| 34 | HE Capabilities | The HE Capabilities element is present if dot11HEOptionImple- mented is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA); other- wise, it is not present. |
| … |  |  |
| 36 | HE 6 GHz Band Capabilities | The HE 6 GHz Band Capabilities element is present if dot11HE- OptionImplemented and dot11HE6GOptionImplemented are true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA). |
| … |  |  |
| 38 | TWT Constraint Parameters | The TWT Constraint Parameters element is optionally present if dot11TWTOptionActivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA); otherwise, it is not present. |
| … |  |  |
| 40 | Unsolicited Block Ack Extension | The Unsolicited Block Ack Extension element is optionally pres- ent if dot11UnsolicitedBAActivated is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA), and is absent otherwise. |
| 41 | WUR Capabilities | The WUR Capabilities element is present when dot11WUROp- tionImplemented is true, except if the STA is an EHT STA in which case the STA follows the rules defined in 35.3.4.5 (Probe Request frame content for a non-AP EHT STA)); otherwise, it is not present. |
| <Last assigned + 1> | Multi-Link | A single Probe Request Multi-Link element is present if dot11- MultiLinkActivated is true and the Probe Request frame is a multi-link probe request as defined in 35.3.4.2 (Use of multi-link probe request and response). Otherwise, the Multi-Link element is not present. |
| <Last assigned + 2> | EHT Capabilities | The EHT Capabilities element is present if dot11EHTOptionIm- plemented is true; otherwise, it is not present. |

**35.3.4.2 Use of multi-link probe request and response**

Tgbe editor: Modify the following paragraph as follows(#19660):

If either the Address 1 field or the Address 3 field of the multi-link probe request is set to the MAC address of the AP that is affiliated with a targeted AP MLD and that corresponds to a nontransmitted BSSID, then the AP MLD ID subfield shall not be present in the Probe Request Multi-Link element of the multi-link probe request.Otherwise, the AP MLD ID subfield shall be present in the Probe Request Multi-Link element of the multi-link probe request and the targeted AP MLD is identified by the AP MLD ID subfield, which is set to the same AP MLD ID value as the one used by the AP that is addressed by the multi-link probe request to identify the AP MLD in the Beacon and Probe Response frames that it transmits.

NOTE – If the addressed AP is affiliated with the targeted AP MLD and the AP is a transmitted BSSID in a multiple BSSID set or the AP is not part of a multiple BSSID set, then the AP MLD ID is set to 0.

Tgbe editor: Modify the following paragraph as follows(#19917):

A multi-link probe request allows a non-AP STA to request an AP affiliated with an AP MLD to include the partial profile for a requested AP affiliated with the targeted AP MLD if the Probe Request Multi-Link element carries a PerSTA Profile subelement for the requested AP to retrieve partial profile.

Tgbe editor: Modify the following paragraph as follows(#19917):

A multi-link probe request allows a non-AP STA to request an AP affiliated with an AP MLD to include the complete profile of all requested APs affiliated with the targeted AP MLD…

Tgbe editor: Modify the following paragraph as follows(#19917):

A multi-link probe request allows a non-AP STA to request an AP affiliated with an AP MLD to include the same requested partial profile for all requested APs affiliated with the targeted AP MLD…

Tgbe editor: Modify the following title as follows(#19941):

**35.3.7.2 TID-to-link mapping (TTLM)**

**35.3.7.2.1 General**

Tgbe editor: Modify the following sentence as follows (delete it) (#19159):

Tgbe editor: Modify the following paragraph as follows (#19686):

— it may be used for individually addressed frame exchange, subject to the power state of the non-AP STA operating on that link and only QoS Data frames and QoS Null frames with TIDs mapped to that link may be transmitted on that link between the corresponding non-AP STA and AP affiliated with the non-AP MLD and the AP MLD, respectively, in the direction (DL/UL) corresponding to the TTLM.

— Individually addressed Management frames and Control frames may be sent on any enabled links between the corresponding non-AP MLD and AP MLD both in DL and UL, except that a BlockAckReq frame requesting TID(s) that are not mapped to a link shall not be transmitted on the link by the corresponding non-AP STA affiliated with the non-AP MLD and by the corresponding AP affiliated with the AP MLD.

**35.3.11 Multi-link procedures for (extended) channel switching and channel quieting**

Tgbe editor: Modify the following paragraph as follows and move it at the end of subclause 35.3.11 (#20058):

Examples of advertising quieting or channel switching information of a link on another link described in this subclause are shown in AF.7 (Example of advertising quieting or channel switching information a link on another link).

Tgbe editor: Insert the following paragraph after the 6th paragraph in subclause 35.3.11 Multi-link procedures for (extended) channel switching and channel quieting (#19217):

If an AP (affected AP) affiliated with an AP MLD is switching channel, the AP MLD shall ensure the new channel is selected so that none of its associated non-AP MLDs has multiple setup links located on overlapping operating channels.

**35.3.23 BSS transition management for MLDs**

Tgbe editor: Modify the following paragraph as follows (#19799):

If an AP MLD uses the BTM protocol to recommend a non-AP MLD to do (re)association with the same AP MLD with a different set of links, the non-AP MLD may follow the recommendation by either:

* (re)associating with the same AP MLD with the recommended set of links or
* initiating an ML reconfiguration negotiation (see 35.3.6.4 (ML reconfiguration to the ML setup)) to operate with the recommended set of setup links or
* initiating a TTLM negotiation (see 35.3.7.2.3 (Negotiation of TTLM)) if the enabled links would match the set of recommended links.

**35.3.12.7 Power state after link enablement**

Tgbe editor: Modify the following paragraph as follows (#fix):

When a link that was previously disabled becomes enabled for a non-AP MLD after successful TTLM negotiation with TID-To-Link Mapping Request/Response frames transmitted on that link, the power management mode of the non-AP STA that is affiliated with the non-AP MLD and that is operating on the link, immediately after the acknowledgement of the TID-To-Link Mapping Response frame , is active mode.

When a link that was previously disabled becomes enabled for a non-AP MLD after successful TTLM negotiation with TID-To-Link Mapping Request/Response frames transmitted on another link, the power management mode of the non-AP STA that is affiliated with the non-AP MLD and that is operating on the link, immediately after the acknowledgement of the TID-To-Link Mapping Response frame , is power save mode, and its power state is doze.

**9.4.2.35 Neighbor Report element**

Tgbe editor: Modify the following paragraph as follows (#19900):

When the Extremely High Throughput subfield is set to 1, and when the Basic Multi-Link element is present as a subelement in the report for a reported AP, the fields included in the Basic Multi-Link element are identical in content to the corresponding fields that are present in the Basic Multi-Link element that the AP includes in the Beacon frames that it transmits.

**9.6.13.9 BSS Transition Management Request frame format**

***Tgbe editor: Modify the following paragraph as follows(***#19466, #19463, #19438)***:***

The Abridged (bit 1) field indicates to the recipient of the frame the intended treatment of all BSSIDs or AP MLDs not listed in the BSS Transition Candidate List Entries field. The AP or AP MLD sets the Abridged bit in the Request Mode field to 1 when a preference value of 0 is assigned to all BSSIDs or AP MLDs that do not appear in the BSS Transition Candidate List or AP MLDs with requested links that are not recommended in the BSS Transition Candidate List. The AP or AP MLD sets the Abridged bit in the Request Mode field to 0 when the AP or AP MLD has no recommendation for or against any BSSID or AP MLD not present in the BSS Transition Candidate List Entries field, or AP MLDs with requested links that are not recommended in the BSS Transition Candidate List.

***Tgbe editor: Modify the following subclause as follows(***#19188)***:***

**Presence Bitmap subfield of the Multi-Link Control field in a Basic Multi-Link element**

The format of the Presence Bitmap subfield of the Multi-Link Control field in a Basic Multi-Link element is defined in [Figure 9-1001g (Presence Bitmap subfield of the Basic Multi-Link element format)](#_bookmark190).

B0 B1 B2 B3

|  |  |  |  |
| --- | --- | --- | --- |
| Link ID Info Present | BSS Parameters Change Count Present | Medium Synchronization Delay Information Present | EML Capabilities Present |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Bits: | 1 | 1 | 1 |  |  | 1 |  |
|  | B4 | B5 | B6 |  | B7 |  | B8 B11 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MLD Capabilities And Operations Present | AP MLD ID Present | Extended MLD Capabilities And Operations Present | Requested AP Profile Missing  | Reserved |

Bits: 1 1 1 1 4

**Figure 9-1001g—Presence Bitmap subfield of the Basic Multi-Link element format**

***Tgbe editor: Add the following paragraph at the end of Subclause (*Presence Bitmap subfield of the Multi-Link Control field in a Basic Multi-Link element*) as follows(***#19188)***:***

The Requested AP Profile Missing field is set to 1 if the Basic Multi-Link element is included in a multi-link probe response and does not contain Per-STA Profile for some of the affiliated APs that are requested APs in the eliciting multi-link probe request. Otherwise, it is set to 0.

**35.3.4.2 Use of multi-link probe request and response**

Tgbe editor: Modify the following paragraph(#19188):

If a non-AP MLD has requested, in its Probe Request frame, the complete profile of several (or all) APs affiliated with an AP MLD (either explicitly or implicitly by not including the Link Info field in the Probe Request Multi-Link element), then it is possible that the responding AP might not be able to fit all the requested profiles due to size or duration limits specified in 9-34 (Maximum data unit sizes (in octets) and durations (in microseconds)). In that case, the AP MLD shall send the complete profile for all requested affiliated APs in multiple multi-link probe responses, each containing complete profile for a set of requested affiliated APs. In all multi-link probe responses, the Requested AP Profile Missing field in the Basic Multi-link element shall be set to 1, except for the last multi-link probe response where it shall be set to 0.