IEEE P802.11  
Wireless LANs

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| LB271 – CR for some CIDs related to 35.3.7.1.x | | | | |
| Date: 2023-04-03 | | | | |
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| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 17336 | Alfred Asterjadhi | 35.3.7.1.2 | 515.25 | This seems to imply that a previously successful negotiation is valid even if the new negotiation did not make it through. Please make it explicit (if somewhere else then add a reference to that somewhere else). | As in comment. | Revised – Agree with the commenter. Clarify the sentence and add statements in 35.3.7.1.3 about how negotiation stays active. Apply the changes marked as #17336 in this document |
| 15820 | Muhammad Kumail Haider | 35.3.7.1.4 | 517.12 | “at the end of an Advertised TID to link mapping” is confusing. Suggest to replace with “after establishment/success of Advertised TID to link mapping negotiation” | as in comment | Revised – clarify the sentence. Apply the changes marked as #15820 in this document. |
| 18137 | Abhishek Patil | 35.3.7.1.4 | 517.12 | Why is this subclause under T2LM clause? It can be moved one level up to be on its own under Link Management or consider moving it under clause 35.3.12 where we have other subclauses related to power management. Same comment for 35.3.7.1.5 | As in comment | Revised – agree with the commenter. Move the subclause to 35.3.12. follow the instructions marked as #18137 in this document |
| 18138 | Abhishek Patil | 35.3.7.1.4 | 517.12 | It will be beneficial to provide examples to cover the 3 cases. Following is a suggestion to consider: ML association consists of link 0 and link 1. Current state: Link0 is enabled & link1 is disabled. Now, AP MLD intends to enable Link1. Case 1 (covers the case of 1st uffered): AP MLD sends T2LM Req on link 0 (to map all TID to both link0 & link1), STA receives the T2LM Req (on link 0) and sends T2LM Resp on link1, then AP must assume non-AP STA operating on link1 is in active mode (match 1st paragraph). Case 2 (covers the case of 1st uffered): AP MLD sends T2LM Req on link 0 (to map all TID to both link0 & link1), STA receives the T2LM Req (on link 0) and sends T2LM Resp on link0, then AP must assume non-AP STA operating on link1 is in power save mode (matches 2nd paragraph). Case 3: AP affiliated with AP MLD advertises T2LM IE (maps all TID to both link0 & link1) in beacon (indicates that link1 will be enabled in 10s). When 10s time expires, link1 become enabled on the non-AP MLD side and will be in power save mode (matches 3rd paragraph). In addition to the above, the draft must clarify that the AP MLD must not reset/assume non-AP STA on link0 is in power save state for the above 3 cases. AP MLD will only change the power-state for non-AP STA on link0 if it receives an explicit PM = 1 indication (see 35.3.12.1). | As in comment | Reject – for the sake of reducing the size of 11be spec, limit the number of examples. |
| 18139 | Abhishek Patil | 35.3.7.1.4 | 517.23 | Clarify that a link that was previously disabled becomes enabled. Same comment and same suggested change for the next paragraph starting L31 | Update the start of the paragraph as: “When a link, that was previously disabled becomes enabled for a ....”. | Revised – make that clarification for every paragraph. Apply the changes marked as #18139 in this document |
| 16496 | Arik Klein | 35.3.7.1.4 | 517.31 | Need to clarify which of the non-AP STAs affiliated with the non-AP MLDs that are associated with an AP MLD that has advertised a TID-to-link mapping (in Beacon or Probe Response frames) enters to power save mode/ doze state. The situation of all non-AP STAs affiliated with each of the associated non-AP MLDs entering into doze state seems unreasonable (AP MLD need to buffer BUs for all non-AP MLDs associated with it) and at least a single affiliated non-AP STA should be in active mode. | The commenter will provide a contribution on this issue, as pointed in the comment | Revised – there is a confusion of what is meant by “becomes enabled”. Follow suggested resolution from CID18139. Apply the changes marked as #18139 in this document |
| 16497 | Arik Klein | 35.3.7.1.5 | 517.37 | Change the title from “disablement” to “link disablement” | as in comment | Revised – agree with the commenter. Apply the changes marked as #16497 |
| 18260 | Li-Hsiang Sun | 35.3.7.1.5 | 517.44 | The 2nd and 3rd bullets describe whether TWT is to be torn down (if negotiated T2LM) or suspended (if advertised T2LM and non-AP supports suspension). However, on p521, there is a procedure that negotiated T2LM is used to update an advertised T2LM, in this case, which bullet should apply? | Clarify if the individual T2LM is used to update an advertised T2LM before the expected duration of the advertised mapping, the TWT on disabled link(s) are suspended if supported by the STA | Reject – this condition is captured in the second subbullet of . |
| 17826 | Yunbo Li | 35.3.7.1.5 | 517.46 | clarify that the TWT agreements and TWT memberships shall be torn down AUTOMATICALLY. And same comment for next bullet. | Add word “automatically” at the end of this bullet and next bullet. | Revised – agree with the commenter. Use the term “as soon as practical” instead of “automatically”. Apply the changes marked as #17826 in this document. |
| 17339 | Alfred Asterjadhi | 35.3.7.1.4 | 517.48 | It is a bit confusing as to what the relation is with The TWT Information frame Disabled and the functionality of suspension and tear down. Please clarify. And also please rephrase this bullet as it is very difficult to understand when it is a tear down and when a suspend. | As in comment. | Revised – rephrase the paragraph to ease understanding. Apply the changes marked as #17339 in this document. |
| 18140 | Abhishek Patil | 35.3.7.1.5 | 517.48 | These rules are hard to follow. Simplify them. The relationship between link disablement and TWT Info frame support is not clear. | As in comment | Revised – rephrase the paragraph to ease understanding. Apply the changes marked as #18140 in this document. |
| 15455 | Lisa Ward | 35.3.7.1.5 | 517.49 | This sentence may be clearer if an ‘and’ was added before the second if as follows: If the link has been disabled due to AP advertisement of TID-to-link mapping (see 35.3.7.1.7 (Advertised TID-to-link mapping in Beacon and Probe Response frames)) and if the non-AP STA affiliated with the non-AP MLD corresponding to the disabled link has set the TWT Information Frame Disabled field to 0 in the TWT element sent during a TWT setup, then the non-AP STA shall consider all TWT Individual and Broadcast agreements suspended until the link is enabled, unless the TWT agreements are already suspended with a resumption time after the Expected Duration expires. | Consider adding ‘and’ before the second if as follows:  If the link has been disabled due to AP advertisement of TID-to-link mapping (see 35.3.7.1.7 (Advertised TID-to-link mapping in Beacon and Probe Response frames)) and if the non-AP STA affiliated with the non-AP MLD corresponding to the disabled link has set the TWT Information Frame Disabled field to 0 in the TWT element sent during a TWT setup, then the non-AP STA shall consider all TWT Individual and Broadcast agreements suspended until the link is enabled, unless the TWT agreements are already suspended with a resumption time after the Expected Duration expires. | Revised – rephrase the paragraph to ease understanding. Apply the changes marked as #15455 in this document. |
| 16006 | Binita Gupta | 35.3.7.1.5 | 517.52 | Use membership for broadcast TWT instead of agreement as per baseline | Change to “...then the non-AP STA shall consider all TWT Individual agreements and broadcast TWT memberships suspended until the link is enabled...” | Revised – agree with the commenter. Apply the changes marked as #16006 in this document. |
| 16007 | Binita Gupta | 35.3.7.1.5 | 517.60 | This para needs some clarification. Is it referring to the power state of the AP for which the link is disabled? If a link is disabled then AP is not operating on that link, so saying that ‘STA is currently operating’ is misleading. | Modify the text to address the issue. | Revised – use the term “corresponding to” instead of “operating on” to avoid the ambiguity. Apply the change marked as #16007 in this document. |
| 16498 | Arik Klein | 35.3.7.1.5 | 517.60 | The following sentence is unclear and should be revised as suggested: “The AP to which the non-AP STA affiliated with the non-AP MLD is associated and operating on the link may cease maintaining a power management status that indicates in which power management mode the STA is currently operating” | The sentence should be revised as follows: “The AP \*affiliated with the AP MLD\* to which the non-AP MLD is associated and operating on the link may cease maintaining a power management status that indicates in which power management mode the STA \*affiliated with that non-AP MLD\* is currently operating” | Revised – agree with the commenter. Apply the changes marked as #16498 in this document |
| 15598 | Bo Sun | 35.3.7.1.6 | 518.14 | the description of “this link” is not accurate enough in the sentence “...TIDs that are mapped to this link by the most recent DL TID-to-link mapping...”ï¼because buffered BUs may have TIDs mapped to multiple links; same as Page518 line26 | change “this link” to “link set” | Revised – mention the link earlier in the paragraph to make this sentence clear. Apply the changes marked as #15598 in this document. |
| 15678 | Yanchao Xu | 35.3.7.1.6 | 518.20 | The setting of More Data or EOSP subfield in MLO still follows the legacy rule (in 11.2.3.6 AP Operation). So all the (Data) frames that are transmitting on different links will set the More Data=1 or EOSP=0, even if there is only very few (even only one) uffered frame in the AP MLD, which will make the all the STAs of the STA MLD on those links keep awake. | Add statements to allow AP MLD use additional rules to set More Data or EOSP besides the legacy rules. The proposed change can be, “ the AP MLD can decide by itself to only set More Data or EOSP subfield in the frames transmitted on part of the available links. - Note. For example, the AP MLD can choose only set More Data or EOSP subfield on frames uffereded on one link to indicate there is/are uffered frames, under the condition that the AP MLD only have very few uffered frames. “ | Reject – how the More Data field is set has been discussed in the group and the current subclause captures the result of these discussions. |
| 16499 | Arik Klein | 35.3.7.1.6 | 518.25 | The sentence “ The indicated frames correspond only to Data frames for the non-AP MLD ... or Management frames ... that \*are not buffered\* because another non-AP STA affiliated with the same non-AP MLD is in active mode .. “ seems to be in conflict with the above paragraph which defines that frame with More Data bit set to 1 apply for frames that are buffered at the AP MLD as well as conflict with the rules states in 35.3.12.4. | Please clarify the distinctions between the paragraphs (by adding a NOTE after the current sentence) or remove this sentence. | Revised – this paragraph should not have been included in D3.0 as it was part of a resolution to CID11962 for LB266 that was rejected. Make the correction by removing the paragraph. Apply the changes marked as #16499 in this document |
| 17360 | Alfred Asterjadhi | 35.3.7.1.6 | 518.25 | Which are these indicated frames. Also this sentence is not very clear as to what it is trying to say. Please clarify. | As in comment. | Revised – this paragraph should not have been included in D3.0 as it was part of a resolution to CID11962 for LB266 that was rejected. Make the correction by removing the paragraph. Apply the changes marked as #16499 in this document |
| 16008 | Binita Gupta | 35.3.7.1.6 | 518.33 | Requirement in this para is not specific to TID-to-link mapping and I assume is capturing existing defined behavior in other clauses referenced. Make this a NOTE instead of repeating as a shall requirement. | As in comment | Revised – Move the subclause to 35.3.12. Follow the instructions marked as #16008 in this document. |
| 17361 | Alfred Asterjadhi | 35.3.7.1.6 | 518.43 | How does the STA know from which TID the pending BUs are so that it can send the PS-Poll in the link that is mapped to that TID? | As in comment. | Reject – it can not, but it knows the TID-mapping. |
| 16500 | Arik Klein | 35.3.7.1.6 | 518.47 | Need to add a condition that the “one of any non-AP STA affiliated with the non-AP MLD that shall follow or continue following the procedures defined in 11.2.3.7 and 11.2.3.8” has to be in PS mode. | Consider revise the sentence as follows: “ , then at least one of any non-AP STA affiliated with the non-AP MLD that is operating on the link (receiving link) or another link to which any of the TIDs that is mapped to the link (receiving link) is also mapped \*and is in PS mode\* shall follow or continue following the procedures defined in 11.2.3.7 (Receive operation for STAs in PS mode) and 11.2.3.8 (Receive operation using APSD) and may send PS-Poll frames or UAPSD trigger frames, if needed, ..” | Revised – agree with the commenter. Apply the changes marked as #16500 in this document. |

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

Tgbe editor: Modify subclause 35.3.4.5 Probe Request frame content for a non-AP EHT STA as follows:

###### Default mapping mode

Under this mode, all TIDs are mapped to all setup links for DL and UL, and all setup links are enabled. A non-AP MLD associated with an AP MLD shall operate under this mode if the following two conditions are met:

a TID-to-link mapping is not advertised by the AP MLD (see [35.3.7.1.7 (Advertised TID-to-link](#bookmark55) [mapping in Beacon and Probe Response frames)](#bookmark55)),

a TID-to-link mapping negotiation for a different mapping did not occur, was unsuccessful while having no successfully negotiated (#17336) non-default TID-to-link mapping before or was torn down(#17336) (see 35.3.7.1.3 (Negotiation of TID-to-link mapping)).

###### Negotiation of TID-to-link mapping

(#17336)A successfully negotiated TID-to-link mapping is active until it is torn down or until it is replaced by a newly negotiated TID-to-link mapping or is modified by a new advertised TID-to-link mapping (see 35.3.7.1.7 (Advertised TID-to-link mapping in Beacon and Probe Response frames)).

###### Power state after (#16497)link enablement

When a link (#18139)that was previously not setup becomes enabled for a non-AP MLD after successful association with an AP MLD with (Re)Association 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 (Re)Association Response frame or of the TID-To-Link Mapping Response frame, is active mode.

When a link (#18139)that was previously not setup becomes enabled for a non-AP MLD after successful association with an AP MLD with (Re)Association 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 (Re)Association Response frame or of the TID-To-Link Mapping Response frame, is power save mode, and its power state is doze.

When a link (#18139)that was previously disabled becomes enabled for a non-AP MLD after successful TID-to-link mapping 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 (Re)Association Response frame or of the TID-To-Link Mapping Response frame, is active mode.

When a link (#18139)that was previously disabled becomes enabled for a non-AP MLD after successful TID-to-link mapping 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 (Re)Association Response frame or of the TID-To-Link Mapping Response frame, is power save mode, and its power state is doze.

When a link (#18139)that was previously disabled by an advertised TID-to-link mapping (see [35.3.7.1.7 (Advertised TID-to-link mapping in Beacon and Probe](#bookmark55) [Response frames)](#bookmark55)) and becomes enabled for a non-AP MLD (#15820)when an advertised TID-to-link mapping(#15820) is terminated (#18139), the power management mode of the non-AP STA that is affiliated with the non-AP MLD and operating on the link, immediately after the end of the advertised TID-to-link mapping, is power save mode, and its power state is doze.

###### Power state and TWT schedules after (#16497)link disablement

When a link becomes disabled for a non-AP MLD:

The APSD scheduled SPs of the non-AP STA affiliated with the non-AP MLD and operating on the link shall be deleted (#17826)as soon as practical.

If the link has been disabled using an individual TID-to-link mapping negotiation, then the TWT agreements and TWT memberships of the non-AP STA affiliated with the non-AP MLD and operating on the link shall be torn down (#17826)as soon as practical.

(#17339, #18140, #15455)If the link has been disabled due to AP advertisement of TID-to-link mapping (see [35.3.7.1.7](#bookmark55) [(Advertised TID-to-link mapping in Beacon and Probe Response frames)](#bookmark55)):

* if the non-AP STA that is affiliated with the non-AP MLD and that corresponds to the disabled link has set the TWT Information Frame Disabled field to 0 in the TWT element sent during a TWT setup, then the non-AP STA shall consider all active (i.e. not suspended) (#16006)Individual TWT (#16006)agreements and Broadcast (#16006)membership suspended as soon as practical until the link is enabled.
* Otherwise, if the non-AP STA has not set the TWT Information Frame Disabled field to 0, then all TWT Individual agreements and broadcast TWT memberships shall be torn down (#17826)as soon as practical.

The non-AP STA that is affiliated with the non-AP MLD and that (#16007)corresponds to the link may cease maintaining a power state and power management mode (#17826) as soon as practical.

The AP that is (#16498)affiliated with the AP MLD to which the (#16498)the non-AP MLD is associated and that (#16007)corresponds to the link may, as soon as practical, (#17826) cease maintaining a power management status that indicates in which power management mode the STA that is (#16498)affiliated with the non-AP MLD and that corresponds to the link is currently operating.

A non-AP STA affiliated with a non-AP MLD that has transmitted a frame to the AP affiliated with its associated AP MLD on a disabled link, if allowed by the rules defined in [35.3.7.1.1 (General)](#bookmark52) and from which it expects a response, shall remain in the awake state until such a response is received or until the procedure has timed out.

###### Use of More Data subfield by an MLD

An AP MLD uses the More Data subfield as defined in 9.2.4.1.8 (More Data subfield) in frames transmitted (#15598)on a link by one of its affiliated AP to a non-AP STA in PS mode affiliated with the non-AP MLD to indicate to the non-AP MLD that more individually addressed BUs are buffered for that non-AP MLD. The indicated buffered BUs are buffered at the AP MLD for the non-AP MLD and correspond only to Data frames for the non-AP MLD and with TIDs that are mapped to this link by the most recent DL TID-to-link mapping (negotiated TID-to-link mapping or default mode mapping, see [35.3.7.1 (TID-to-link mapping)](#bookmark51)) or Management frames for the non-AP MLD or for a non-AP STA affiliated with the non-AP MLD (see Table 11-3 (Bufferable/nonbufferable classification of MMPDUs) and [35.3.12.4 (Traffic indication)](#bookmark72)).

An AP affiliated with an AP MLD shall follow the procedure defined in 11.2.3.6 (AP operation) for setting the More Data subfield and the EOSP subfield, except that in individually addressed frames the More Data subfield is used to indicate the presence of more BUs at the AP MLD for a non-AP MLD, as defined above.

(#16499, #17360)

When a non-AP STA that is in PS mode and that is affiliated with a non-AP MLD operating with default mapping (see [35.3.7.1.2 (Default mapping mode)](#bookmark53)) receives an individually addressed MPDU from its associated AP affiliated with the associated AP MLD with the More Data subfield set to 1, then at least one of any non-AP STA affiliated with the non-AP MLD shall follow or continue following the procedure defined in 11.2.3.7 (Receive operation for STAs in PS mode) and 11.2.3.8 (Receive operation using APSD) and may send PS-Poll frames or UAPSD trigger frames, if needed, to retrieve buffered BUs buffered at the AP MLD.

When a non-AP STA that is in PS mode and that is affiliated with a non-AP MLD operating with a negotiated non-default TID-to-link mapping (see [35.3.7.1.3 (Negotiation of TID-to-link mapping)](#bookmark54)) receives an individually addressed MPDU from its associated AP with the More Data subfield set to 1 on a link (receiving link), then at least one of any non-AP STA (#16500) that is affiliated with the non-AP MLD (#16500), that is in PS mode and that is operating on the link (receiving link) or another link to which any of the TIDs that is mapped to the link (receiving link) is also mapped shall follow or continue following the procedures defined in 11.2.3.7 (Receive operation for STAs in PS mode) and 11.2.3.8 (Receive operation using APSD) and may send PS-Poll frames or UAPSD trigger frames, if needed, with any TID that is mapped to this operating link to retrieve the buffered BUs buffered at the AP MLD.

(#18137)Tgbe editor: Move subclause 35.3.7.1.4 (Power state after link enablement) and all its content to a new subclause 35.3.12.7 (Power state after link enablement). Move subclause 35.3.7.1.5 (Power state and TWT schedules after link disablement) and all its content to a new subclause 35.3.12.8 (Power state and TWT schedules after link disablement). Add the following paragraph at the end of subclause 35.3.7.1.1 (General): The power state of a non-AP STA affiliated with a non-AP MLD immediately after a link that was disabled or not setup becomes enabled follows the rules defined in 35.3.12.7 (Power state after link enablement). The power state and TWT schedules of a non-AP STA affiliated with a non-AP MLD immediately after a link becomes disabled follows the rules defined in 35.3.12.8 (Power state and TWT schedules after link disablement).

(#16008)Tgbe editor: Move subclause 35.3.7.1.6 (Use of More Data subfield by an MLD) and all its content to a new subclause 35.3.12.9 (Use of More Data subfield by an MLD). Add the following paragraph at the end of subclause 35.3.7.1.1 (General): The use of More Data subfield by and MLD for the different possible TID-to-link mappings follows the rules defined in 35.3.12.9 (Use of More Data subfield by an MLD).