**IEEE P802.11
Wireless LANs**

|  |
| --- |
| LB275 CR for 35.3.7.2.3 (Negotiation of TID-to-link mapping)  |
| Date: 2023-09-11 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Yongho Seok | Mediatek |  |  | yongho.seok@mediatek.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGbe 4.0 with the following CIDs (32 CIDs):

* 19006, 19687, 19772, 19773, ~~19774~~, 19688, 19689, 19690, 19691, 19692, 19693, 19694, 19695, 19696, 19697, 19214, 19698, 19254, 19255, 19315, 20041, 19256, ~~20043~~, 19257, 20042, ~~19699, 19700~~, 19944, 19258, 19259, 19260, 19261

Revisions:

* Rev 0: Initial version of the document.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the subsequent TGbe Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

| **CID** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- |
| 19006 | 522.22 | As the MIB "dot11TIDtoLinkMappingActivated" indicates only whether a MLD supports TTLM negotiation, change its name to be more explicit by "dot11NegotiationTIDtoLinkMappingActivated" | As in comment | Rejected-The negotiation of TID To Link Mapping is just one of mode in the TID To Link Mapping mechanism. The proposed MIB variable name does not capture this.  |
| 19687 | 522.24 | A frame is transmitted between peer entities, not an element. Need to revise the term "the Basic Multi-Link element that it transmits" as suggested | Consider revising the sentence as follows:" the Basic Multi-Link element which is carried in a frame that it transmits" | Rejected-The information element is transmitted between the peer entities.  |
| 19772 | 522.25 | This is a duplication of the text in Table 9-404j (Subfields of the MLD Capabilities And Operations subfield) for T2LM capability. Also the description for mode 1 is inaccurate - 'all TIDs are mapped to the same link set \*\*in both directions\*\*'. | Delete the 3 sentences starting the second sentence in the paragraph and provide a reference to Table 9-404j so that there is only one place that describes each mode and the description (and expected behavior) is consistent across the spec. Duplication will lead to errors in the spec. | Rejected-Table 9-404j defines how to encode the subfield. This subclause (Negotiation of TTLM) defines the normative hehaviors of the STA.  |
| 19773 | 522.35 | Clause 35.3.7.2.5 provide details of T2LM setup during (re)association. Add a reference to 35.3.7.2.5 in this paragraph. | As in comment | Revised- Agree in principle.TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19773. |
| **35.3.7.2.3 Negotiation of TTLM**…During a ML (re)setup procedure, a non-AP MLD may initiate a TTLM negotiation according to the 35.3.7.2.5 (Association procedures for TTLM). ~~During a ML (re)setup procedure, a non-AP MLD may initiate a TTLM negotiation by including the TID-To-Link Mapping element in the (Re)Association Request frame if an AP MLD has indicated a support of TTLM negotiation.~~ ~~Otherwise, the non-AP MLD shall not include the TID-To-Link Mapping element in the (Re)Association Request frame.~~ (#19773)**35.3.7.2.5 Association procedures for TTLM Association procedures for TTLM**During a ML (re)setup procedure, a non-AP MLD may initiate a TTLM negotiation by including the TID-To-link Mapping element in the (Re)Association Request frame if an AP MLD has indicated a support of TTLM negotiation. Otherwise, the non-AP MLD shall not include the TID-To-Link Mapping element in the (Re)Association Request frame. (#19773) |
| 19688 | 522.45 | The term "responding MLD" (which is used only in 35.3.7.2.3) for the peer MLD of the "initiating MLD" does not seem to align with the terminology usage in the 802.11 spec (for instance: in the TWT case- "Responding STA" is used for the peer STA of "Requesting STA").Please replace the term, as suggested. | Consider replacing the term "responding MLD" as the peer side for the "initiating MLD" to either of the options:Option 1 - "receiving MLD", similarly to the usage in case of EPCS priority access service (35.16.2.2): "Initiating AP MLD" vs. "Receiving AP MLD"Option 2 - "solicited MLD" (as opposed to the "unsolicited TID-To-Link Mapping Response frame" term in the same subclause) | Revised- Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19688. |
| 19689 | 522.47 | The term "responding MLD" (which is used only in 35.3.7.2.3) for the peer MLD of the "initiating MLD" does not seem to align with the terminology usage in the 802.11 spec (for instance: in the TWT case- "Responding STA" is used for the peer STA of "Requesting STA").Please replace the term, as suggested. | Consider replacing the term "responding MLD" as the peer side for the "initiating MLD" to either of the options:Option 1 - "receiving MLD", similarly to the usage in case of EPCS priority access service (35.16.2.2): "Initiating AP MLD" vs. "Receiving AP MLD"Option 2 - "solicited MLD" (as opposed to the "unsolicited TID-To-Link Mapping Response frame" term in the same subclause) | Revised- Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19689. |
| 19690 | 522.51 | The term "responding MLD" (which is used only in 35.3.7.2.3) for the peer MLD of the "initiating MLD" does not seem to align with the terminology usage in the 802.11 spec (for instance: in the TWT case- "Responding STA" is used for the peer STA of "Requesting STA").Please replace the term, as suggested. | Consider replacing the term "responding MLD" as the peer side for the "initiating MLD" to either of the options:Option 1 - "receiving MLD", similarly to the usage in case of EPCS priority access service (35.16.2.2): "Initiating AP MLD" vs. "Receiving AP MLD"Option 2 - "solicited MLD" (as opposed to the "unsolicited TID-To-Link Mapping Response frame" term in the same subclause) | Revised- Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19690. |
| 19693 | 522.56 | The term "responding MLD" (which is used only in 35.3.7.2.3) for the peer MLD of the "initiating MLD" does not seem to align with the terminology usage in the 802.11 spec (for instance: in the TWT case- "Responding STA" is used for the peer STA of "Requesting STA").Please replace the term, as suggested. | Consider replacing the term "responding MLD" as the peer side for the "initiating MLD" to either of the options:Option 1 - "receiving MLD", similarly to the usage in case of EPCS priority access service (35.16.2.2): "Initiating AP MLD" vs. "Receiving AP MLD"Option 2 - "solicited MLD" (as opposed to the "unsolicited TID-To-Link Mapping Response frame" term in the same subclause) | Revised- Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19693. |
| 19695 | 522.59 | The term "responding MLD" (which is used only in 35.3.7.2.3) for the peer MLD of the "initiating MLD" does not seem to align with the terminology usage in the 802.11 spec (for instance: in the TWT case- "Responding STA" is used for the peer STA of "Requesting STA").Please replace the term, as suggested. | Consider replacing the term "responding MLD" as the peer side for the "initiating MLD" to either of the options:Option 1 - "receiving MLD", similarly to the usage in case of EPCS priority access service (35.16.2.2): "Initiating AP MLD" vs. "Receiving AP MLD"Option 2 - "solicited MLD" (as opposed to the "unsolicited TID-To-Link Mapping Response frame" term in the same subclause) | Revised- Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19695. |
| 19697 | 522.63 | The term "responding MLD" (which is used only in 35.3.7.2.3) for the peer MLD of the "initiating MLD" does not seem to align with the terminology usage in the 802.11 spec (for instance: in the TWT case- "Responding STA" is used for the peer STA of "Requesting STA").Please replace the term, as suggested. | Consider replacing the term "responding MLD" as the peer side for the "initiating MLD" to either of the options:Option 1 - "receiving MLD", similarly to the usage in case of EPCS priority access service (35.16.2.2): "Initiating AP MLD" vs. "Receiving AP MLD"Option 2 - "solicited MLD" (as opposed to the "unsolicited TID-To-Link Mapping Response frame" term in the same subclause) | Revised- Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19697. |
| **35.3.7.2.3 Negotiation of TTLM**…After the ML (re)setup is successful and 4-way handshake is complete (if RSNA is required), to negotiate a TTLM, an initiating MLD with dot11TIDtoLinkMappingActivated equal to true shall send an individually addressed TID-To-Link Mapping Request frame through an affiliated STA, on any enabled link, to a ~~responding~~ peer (#19688) MLD that has indicated support of TTLM negotiation.Upon receiving the individually addressed TID-To-Link Mapping Request frame, the ~~responding~~ peer (#19689) MLD shall send an individually addressed TID-To-Link Mapping Response frame through an affiliated STA, on any enabled link, to the initiating MLD according to the following rules: —If the ~~responding~~ peer (#19690) MLD accepts the requested TTLM in the TID-To-Link Mapping element in the received TID-To-Link Mapping Request frame, it shall set to 0 (SUCCESS) the Status Code field in the TID-To-Link Mapping Response frame and not include the TID-To-Link Mapping element in the frame.—Otherwise, the ~~responding~~ peer (#19693) MLD shall indicate rejection of the proposed TTLM by either: •Setting to 133 (DENIED\_TID\_TO\_LINK\_MAPPING) the Status Code in the TID-To-Link Mapping Response frame. The ~~responding~~ peer (#19695) MLD shall not include the TID-To-Link Mapping element in the frame.•Setting to 134 (PREFERRED\_TID\_TO\_LINK\_MAPPING\_SUGGESTED) the Status Code field in the TID-To-Link Mapping Response frame. The ~~responding~~ peer (#19697) MLD shall include a pre­ferred mapping in the TID-To-Link Mapping element in the frame. |
| ~~19774~~ | ~~522.41~~ | ~~Clarify that when either MLD supports only mode 1, then only one T2LM IE is carried in the Request/Response frames and the Direction field is set to 2.~~ | ~~As in comment~~ | ~~Revised-~~ ~~Agree in principle.~~ ~~TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19774.~~ |
| **35.3.7.2.3 Negotiation of TTLM**…After the ML (re)setup is successful and 4-way handshake is complete (if RSNA is required), to negotiate a TTLM, an initiating MLD with dot11TIDtoLinkMappingActivated equal to true shall send an individually addressed TID-To-Link Mapping Request frame through an affiliated STA, on any enabled link, to a responding MLD that has indicated support of TTLM negotiation. The initiating MLD includes only one TID-To-Link Mapping element in the TID-To-Link Mapping Request frames and the Direction field is set to 2 unless the initiating MLD received from the peer MLD the TID-To-Link Mapping Negotiation Support subfield value equal to 3. (#19774)  |
| 19691 | 522.51 | Add the word "carried" to avoid the pattern "in the... in the....", as suggested | Modify the sentence as follows: "If the responding MLD accepts the requested TTLM in the TID-To-Link Mapping element \*carried\* in the received TID-To-Link Mapping Request frame, ..." | Accepted |
| 19692 | 522.52 | Revise the sentence for better clarity (Subject before Object), as follows:"..., it shall set the Status Code field to 0 (SUCCESS) in the TID-To-Link Mapping Response frame..." | As in comment | Accepted |
| 19694 | 522.58 | Revise the sentence for better clarity (Subject before Object), as follows: "Setting the Status Code field to 133 (DENIED\_TID\_TO\_LINK\_MAPPING) in the TID-To-Link Mapping Response frame. " | As in comment | Accepted |
| 19696 | 522.61 | Revise the sentence for better clarity (Subject before Object), as follows: "Setting the Status Code field to 134 (PREFERRED\_TID\_TO\_LINK\_MAPPING\_SUGGESTED) in the TID-To-Link Mapping Response frame. " | As in comment | Accepted |
| 19214 | 523.01 | An MLD can omit indicating preferred link information for a specific TID when transmitting the TID-to-Link Mapping Response. In this case, the receiving MLD of the TID-to-Link Mapping Response frame unable to know the preferred mapping status for the TID that was not indicated. | One of the following two options could be considered1. TIDs for which preferred link mapping is not specified are interpreted as preferring mapping to all setup links2. When indicating preferred TID-to-link mapping, an MLD shall indicate preferred link mapping for all TIDs | Rejected-Not providing a preferred link information for a specific TID is that the AP does not have any preferred link information at this moment. |
| 19698 | 523.01 | Revise the sentence, so all the verbs will be in the same tense, as suggested. | Revise the sentence as follows: "An MLD may suggest a preferred TTLM to a peer MLD by sending an unsolicited TID-To-Link Mapping Response frame with the following setting: the Dialog Token field is equal to 0, the TID-To-Link Mapping element is included and the Status Code field is equal to 134 (PREFERRED\_TID\_TO\_LINK\_MAPPING\_SUGGESTED). " | Accepted |
| 19254 | 523.09 | The two requirements represented by the text "When initiating a TTLM negotiation with a peer MLD, an MLD should take into account the preferred TTLM of the peer MLD if it has indicated one. In addition, an AP MLD should take into account the traffic flow(s) from the non-AP MLD and the capabilities and constraints (e.g., single radio operation), if any, of the non-AP MLD when providing a preferred TTLM or initiating a TTLM negotiation with the non-AP MLD" specify behavior that is not part of the over-the-air protocol and thus are not at all testable. These are in fact implementation suggestions. | Convert this from normative text to a non-normative note | Rejected-This is about how to provide or negotitate the TID-To-Link Mapping.This is a part of the over-the-air protocol, and testable if needed by checking the TID-To-Link Mapping element.   |
| 19255 | 523.16 | Missing word: "A multi-radio non-AP MLD should accept a TTLM negotiation initiated by its associated AP MLD." should be "A multi-radio non-AP MLD should accept a TTLM initiated by its associated AP MLD." | As in comment | Revised-Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19255. |
| **35.3.7.2.3 Negotiation of TTLM**…A multi-radio non-AP MLD should accept a TTLM negotiation (#19255) initiated by its associated AP MLD. A TTLMnegotiation is successful if an MLD successfully transmits or receives a TID-To-Link Mapping Response frame with the value of the Status Code field equal to 0 (SUCCESS). |
| 19315 | 523.18 | TTLM negotiation is successful even if an MLD successfully transmits TTLM Response but a peer MLD fails to receive ? | Replace "transmits or receives" with "transmits and receives" ? | Rejected- If an MLD successfully transmits TTML Response frame, it means that the peer MLD successfully receives TTML Response frame. |
| 20041 | 523.24 | It is not clear what is a \*mapping scheme\*. Clause ï»¿35.3.7.2.4 does not use that terminology. | Revise as follows:"ï»¿After teardown of a negotiated TTLM, if aTTLM is advertised by the AP MLD as described in 35.3.7.2.4 ...." | Accepted |
| 19256 | 523.31 | Use of "the" suggests there is only one possible TTLM, when there are many. | Change "Once an MLD has successfully negotiated the TTLM with a peer..." to "Once an MLD has successfully negotiated a TTLM with a peer" and change "If an MLD has failed to negotiate the TTLM with a peer MLD..." to "If an MLD has failed to negotiate a TTLM with a peer MLD..." in this parargaph | Accepted |
| ~~20043~~ | ~~523.32~~ | ~~Following text "ï»¿In case TTLMof a specific TID is missing in the negotiation, the most recent TTLM of this TID shall remain unchangedand valid ..." conflicts with the text on pg520 ln32 "...ï»¿which means that a TTLM change is only valid and successful if it will not result inhaving any TID for which the link set for DL or UL is made of zero setup links."~~ | ~~Clarify text to make it consistent.~~ | ~~Rejected-~~~~There is no confliction.~~~~The comment fails to identify a specific issue to be addressed. It fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined.~~ |
| 19257 | 523.35 | The phrase "the most recent TTLM of all TIDs" suggests that the last negotiation that involved all the TIDs is the one that should be used, when the fact that if a TID retains its prior mapping if it is omitted in a negotiation suggests that it should be the last negotiated mapping for each of the TIDs | Change "the most recent TTLM of all TIDs" to "the most recent TTLM for each of the TIDs" | Accepted |
| 20042 | 523.35 | We do not need the unless part of sentences in this paragraph, because it is understood that a new negotiated TTLM will replace previous TTLM for a TID. Also clause ï»¿35.3.7.1 (General) does not define any specific procedure for update of TTLM. | Remove text starting from \*unless\* in both places in the para. | Revised- It also includes the Advertised TTLM which is not the negotiated TTML. Change the reference from 35.3.7.1 to 35.3.7.2.1. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 20042. |
| **35.3.7.2.3 Negotiation of TTLM**…Once an MLD has successfully negotiated the TTLM with a peer MLD, both the MLD and the peer MLD shall update uplink and/or downlink TTLM information according to the negotiated TTLM. In case TTLMof a specific TID is missing in the negotiation, the most recent TTLM of this TID shall remain unchanged and valid unless it is successfully updated according to the procedure defined in ~~35.3.7.1 (General)~~ 35.3.7.2.1 (General) (#20042). |
| ~~19699~~ | ~~523.43~~ | ~~According to 35.3.7.2.1 P520L7: "The TTLM mechanism allows an AP MLD and a non-AP MLD that performed or are performing ML setup to determine how Data frames belonging to TIDs 0-7 and Management frames will be assigned for transmission, on the setup links between the two MLDs in DL and UL."Therefore, the result of setting 0 in Link ID j of TID i is that MPDU corresponding to TID i shall not be assigned for transmission on the link associated with link j (rather than "shall not be mapped to link associated with link j").Please revise the sentence as suggested.~~ | ~~Please revise the sentence as follows: "When an MLD has successfully negotiated with a peer MLD an uplink and/or downlink TTLM in which the bit position i of the Link Mapping Of TID n field in the TID-To-Link Mapping element in the (Re)Association Request frame or TID-To-Link Mapping Request frame is set to 0, \*an MPDU corresponding to\* TID n shall not be \*assigned for transmission on\* the link associated with the link ID i in the uplink and/or downlink based on the Direction subfield in the TID-To-Link Mapping element. "~~ | ~~Rejected-~~ ~~The rules when the TID is mapped to the specific links are defined in the 35.3.7.2.1 and 35.3.7.2.2.~~ ~~This sentence defines how the TID is mapped ot the specific links.~~ |
| ~~19700~~ | ~~523.53~~ | ~~According to 35.3.7.2.1 P520L7: "The TTLM mechanism allows an AP MLD and a non-AP MLD that performed or are performing ML setup to determine how Data frames belonging to TIDs 0-7 and Management frames will be assigned for transmission, on the setup links between the two MLDs in DL and UL."Therefore, the result of setting 1 in Link ID j of TID i is that MPDU corresponding to TID i can be assigned for transmission on the link associated with link j (rather than the vague terminology of "shall be mapped to link associated with link j").Please revise the sentence as suggested.~~ | ~~Please revise the sentence as follows: "When an MLD has successfully negotiated with a peer MLD an uplink and/or downlink TTLM in which the bit position i of the Link Mapping Of TID n field in the TID-To-Link Mapping element in the (Re)Association Request frame or TID-To-Link Mapping Request frame is set to 1, \*an MPDU corresponding to\* TID n \*can\* be \*assigned for transmission on\* the link associated with the link ID i in the uplink and/or downlink based on the Direction subfield in the TID-To-Link Mapping element."~~ | ~~Rejected-~~ ~~The rules when the TID is mapped to the specific links are defined in the 35.3.7.2.1 and 35.3.7.2.2.~~ ~~This sentence defines how the TID is mapped ot the specific links.~~ |
| 19944 | 523.64 | clarify that the Mapping Switch Time field is in the TID-To-Link Mapping element. | as in comment. | Revised-Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19944.  |
| **35.3.7.2.4 Advertised TTLM in Beacon and Probe Response frames**…An AP that advertises a TTLM shall include the Mapping Switch Time field in the TID-To-Link Mapping element (#19944) and shall set it to the time, in units of TUs, of the TBTT of a DTIM beacon of one of the APs affiliated with the AP MLD… |
| 19258 | 524.10 | The text "more than one TID-to-link Mapping elements" should be "more than one TID-to-link Mapping element" | As in comment | Revised-Agree in principle. TGbe editor to make the changes shown in 11-23/1543r1 under all headings that include CID 19258. |
| **35.3.7.2.4 Advertised TTLM in Beacon and Probe Response frames**…NOTE 1—A non-AP MLD might receive more than one ~~TID-to-link Mapping elements~~ TID-To-Link Mapping element (#19258) on more than one link which indicate different times for the advertised TTLM to be established due to the granularity of the Mapping Switch Time field. In that case, if the non-AP MLD receives the mapping switch time on the link to be disabled, the non-AP MLD uses that as the time for the advertised TTLM to be disabled and otherwise, the non-AP MLD might choose any time as indicated in the received TID-to-link Mapping elements as the time for the advertised TTLM to be established. |
| 19259 | 525.22 | The text "If the advertised TTLM is the default mapping" is not specific enough because the advertising process deals might include 2 TTLMs - the current and the future.. Judging by the remainder of the sentence, this is referring to the future mapping | Change "If the advertised TTLM is the default mapping..." to "If the future TTLM is to be the default mapping..." | Rejected- The advertised TTML already implies the future signaing after receiving the TTLM. The comment fails to identify a specific issue to be addressed. It fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined. |
| 19260 | 525.32 | The phrase "sufficiently large value" is not particularly useful because it provides now basis for determining what is large enough. | Expand the sentence to indicate what basis should be used for detemining the size. Also, given that this text describes behavior of the AP that is not inherently testable, revise to make it non-normative. | Rejected-“The Mapping Switch Time field should initially be set to a sufficiently large value.”This provides a guideline of the Mapping Switch Time field. And the baseline spec also provides the similar guideline for that procedure.  |
| 19261 | 525.60 | Replace "TTLMthat" with "TTLM that" | As in comment |  Accepted |