IEEE P802.11
Wireless LANs

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| LB275 CR for 35.3.7.2.4 part 2 |
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 Abstract

This submission proposes resolutions for following 13 CIDs received for TGbe LB275:

19948 19653 19945 19702 20044 19775 19703 19704 19705 19949

19950 20046 20074

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 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.***

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| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 19948 | Rubayet Shafin | 35.3.7.2.4 | 523.58 | Once an AP MLD successfully establishes an advertised TTLM, the corresponding TTLM element should be included in all the Beacons and Probe Response frames until the end of the advertised TTLM as indicated by the Expected Duration field (otherwise, the newly associataed client devices may initiate new TTLM that can potentially violate the existing advertised TTLM). This needs to be spelled out. | as in comment. | Rejected.It is already stated in P525 L28~32 that “All APs affiliated with an AP MLD that advertises a TTLM shall include the same mapping in all Beacon and Probe Response frames from the time at which the TTLM is first advertised until the time at which the TTLM is no longer advertised, and shall include the Expected Duration field in all TID-To-Link Mapping elements in Beacons.” which satisfies the comment. |
| 19653 | Massinissa Lalam | 35.3.7.2.4 | 523.64 | "An AP that advertises a TTLM shall include the Mapping Switch Time field 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." This sentence implies that Mapping Switch Time field is always present, which seems to contradict the definition in 9.4.2.314 which allows this field to be not present: "The Mapping Switch Time field is present when the TID-To-Link Mapping element is transmitted by an AP affiliated with an AP MLD in a Beacon or Probe Response frame and the indicated TTLM is not yet established; otherwise, the field is not present". I guess the intention is to state that the Mapping Switch Time shall be present if the AP wants to advertise a new TTLM. | Replace with "An AP that advertises a new TTLM to be applied shall include the Mapping Switch Time field 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." | RevisedAgree in principle with the comment.TGbe Editor:Please implement the changes in this document tagged as #19653 |
| 19945 | Rubayet Shafin | 35.3.7.2.4 | 524.02 | Need to clarify whether the non-AP STA operating on that link can initiate the TXOP within the 1 TU window before the TBTT. If not, what is the point of saying the link is enabled 1 TU before the indicated TBTT of the DTIM? | clarify the behavior of the non-AP STA side. | Rejected.It has been discussed in the previous round of comment resolution. The AP MLD may indicate different time on different links for the advertised TTLM to be established due to the granularity issue of the Mapping Switch Time field. The non-AP MLD may use the time indicated on any of the links as the time for the advertised TTLM to be established, which can be 1TU before the TBTT of the DTIM Beacon frame (the reference Beacon). To simplify the design, no requirement is put on the non-AP MLD side, and the AP is only required to enable that link 1 TU before the TBTT of the DTIM Beacon. |
| 19702 | Arik Klein | 35.3.7.2.4 | 524.05 | Please add a sentence (similar to that in P512L52, before NOTE1) for the case that the Reconfiguration Multi-Link element is included in a nontransmitted BSSID profile of a Multiple BSSID element, as suggested | Consider one of the following options:1. Option 1: "..., and should end the \*its obtained\* TXOP on that link at least one TU before the TBTT of that DTIM Beacon frame."2. Option 2 :"..., and should end the \*frame exchange\* with any non-AP STA on that link at least one TU before the TBTT of that DTIM Beacon frame. " | Rejected.The comment and the proposed change do not match each other. No technical issue has been identified by the comment. |
| 20044 | Binita Gupta | ï»¿35.3.7.2.4 | 524.16 | Move example Figure 35-7 to Appendix AF, since examples for most other features are captured in that appendix. | As per comment | RevisedAgree in principle with the comment.TGbe Editor:Please implement the changes in this document tagged as #20044 |
| 19775 | Abhishek Patil | 35.3.7.2.4 | 524.52 | Clarify that when either MLD supports only mode 1, the Direction field is set to 2. | As in comment | Rejected.For advertised TTLM, the Direction field is always set to 2 regardless of the supported mode. |
| 19703 | Arik Klein | 35.3.7.2.4 | 525.18 | The same TID-to-link Mapping element is designated differently in P525L16 ("currently established advertised TID-To-Link Mapping element") and in P525L19 ("existing TID-To-Link Mapping element").Please align the designations corresponding to the same TID-to-link Mapping element. | The sentence should be revised as follows: " The value of the Expected Duration field of the \*currently established\* TID-To-Link Mapping element shall indicate a remaining duration that ends at the same time as indicated by the Mapping Switch Time field of the TID-To-Link Mapping element." | RevisedAgree in principle with the comment. We need to use the same name for the same TTLM element.TGbe Editor:Please implement the changes in this document tagged as #19703 |
| 19704 | Arik Klein | 35.3.7.2.4 | 525.18 | Need to clarify that TID-to-link Mapping element mentioned at the end of the following sentence refers to the TID-to-link Mapping element indicating the future advertised TTLM: " The value of the Expected Duration field of the existing TID-To-Link Mapping element shall indicate a remaining duration that ends at the same time as indicated by the Mapping Switch Time field of the TID-To-Link Mapping element."Please revise the sentence as suggested. | The sentence should be revised as follows: " The value of the Expected Duration field of the existing TID-To-Link Mapping element shall indicate a remaining duration that ends at the same time as indicated by the Mapping Switch Time field of the TID-To-Link Mapping element \*indicating the future advertised TTLM\*." | RevisedAgree in principle with the comment. We need to use the same name for the same TTLM element. We can use the name “other TTLM element” here.TGbe Editor:Please implement the changes in this document tagged as #19704 |
| 19705 | Arik Klein | 35.3.7.2.4 | 525.56 | Need to emphasize that the advertised TTLM shall be discarded only if the negotiated TTLM was a successful negotiation as defined in 35.3.7.2.3 (P523L17 ).Please revise the sentence as suggested. | The sentence should be revised as follows: "An individually negotiated TTLM whose \*successful\* negotiation was completed prior to the .... " | Rejected.The “individually negotiated TTLM” can only exist when the negotiation was successful. So, there’s no need to mention that the negotiation was successful |
| 19949 | Rubayet Shafin | 35.3.7.2.4 | 525.46 | Why default mapping? Immediately after the end of the lifetime of the advertised TTLM, the non-AP MLD should fall back to whatever negotiated TTLM agreement (if there was any) it had before the advertised TTLM was established. This is much more efficient. | as in comment. | Rejected.According to the suggestion of the comment, the AP MLD needs to cache a previous TTLM for each non-AP MLD, which results in extra cost. We need to see the benefit of doing so before bringing the extra cost. |
| 19950 | Rubayet Shafin | 35.3.7.2.4 | 525.56 | Discarding would cause inefficiency. The negotiated agreement should be reinstated after the end of the advertised TTLM. | as in comment. | Rejected.According to the suggestion of the comment, the AP MLD needs to cache a previous TTLM for each non-AP MLD, which results in extra cost. We need to see the benefit of doing so before bringing the extra cost. |
| 20046 | Binita Gupta | ï»¿35.3.7.2.4 | 525.22 | NOTE 3 is confusing. The AP never advertises a default TTLM in Beacon, so saying that "ï»¿If the advertised TTLM is the default mapping..." is not accurate. Revise NOTE to correct this. | Revise NOTE 3 as per comment. | RevisedAgree in principle with the comment. TGbe Editor:Please implement the changes in this document tagged as #20046 |
| 20074 | Li-Hsiang Sun | 35.3.7.2.4 | 525.32 | "The Mapping Switch Time field should initially be set to a sufficiently large value."In the figure 35-7 the initial beacon carrying TID-to-Link Mapping element containing Mapping Switch Time field til mapping switch time is larger than DTIM intervals of all linksSuggest procedure text to match the figure | Change to "The Mapping Switch Time field should initially be set to a sufficiently large value such that the time duration till Mapping switch Time is not smaller than the DTIM interval of the link transmitting the Beacon or Probe Response" | RevisedAgree in principle with the comment. We use two DTIM periods, same as the Expected Duration field described at the end of this paragraph.TGbe Editor:Please implement the changes in this document tagged as #20074 |

**35.3.7.2.4 Advertised TTLM in Beacon and Probe Response frames**

TGbe Editor: please update the subclause as follows:

An AP MLD may advertise a mandatory TTLM by including a TID-To-Link Mapping element in the Beacon and Probe Response frames that the APs affiliated with the AP MLD transmit.

An AP that advertises a (#19653)new TTLM shall include the Mapping Switch Time field 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. If a link is going to be enabled according to the advertised TTLM, the AP MLD should enable that link one TU before the TBTT of that DTIM Beacon frame, and shall not initiate a TXOP to any non-AP STA on that link before the TBTT of that DTIM beacon frame. If a link is going to be disabled according to the advertised TTLM, the AP MLD shall disable that link no earlier than the TBTT of that DTIM beacon, and should end the TXOP with any non-AP STA on that link at least one TU before the TBTT of that DTIM Beacon frame. Beginning at the time indicated in the Mapping Switch Time field, the indicated TTLM is established and the Mapping Switch Time field is no longer included.

NOTE 1—A non-AP MLD might receive more than one TID-to-link Mapping elements 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.

(#20044) An example of an advertised TTLM taking effect on all links is shown in AF.5 (Example of TTLM frame exchange).

An AP that advertises a TTLM shall map all TIDs to the same link set in the advertised TTLM, both for DL and UL. The Direction field of an advertised TID-To-Link Mapping element shall be set to 2.

NOTE 2—An advertised TTLM will include a mapping for all TIDs.

An AP with dot11MultiBSSIDImplemented set to true shall follow the rules described in 11.1.3.8.4 (Inheritance of element values) for inheriting or not inheriting an advertised TTLM. Specifically:
— If the advertised TTLM for the transmitted BSSID does not apply to a nontransmitted BSSID in the same multiple BSSID set and the nontransmitted BSSID does not have an active advertised TTLM, then the profile for that nontransmitted BSSID carries a Non-Inheritance element which includes the Element ID Extension of the TID-To-Link Mapping element.
— If the transmitted BSSID and a nontransmitted BSSID in the same multiple BSSID set have different advertised TTLMs, then the profile for that nontransmitted BSSID includes TID-To-Link Mapping element(s) to indicate the advertised TTLM for the nontransmitted BSSID.
— If the configuration of links (such as link ID assignments, number of links, etc.) is not the same for the AP MLD of the transmitted BSSID and the AP MLD of a nontransmitted BSSID in the same multiple BSSID set, and the nontransmitted BSSID is advertising TTLM, then the profile for that nontransmitted BSSID includes TID-To-Link Mapping element(s) to indicate the advertised TTLM for the nontransmitted BSSID.

An AP MLD shall include two TID-To-Link Mapping elements in the Beacon and Probe Response frames that the APs affiliated with the AP MLD transmit, if there is already an established advertised TTLM and the AP MLD intends to replace it with a nondefault advertised TTLM. In this case, the AP MLD shall not include the Mapping Switch Time field in the currently established advertised TID-To-Link Mapping element, and shall include the Mapping Switch Time field in the other TID-To-Link Mapping element, in order to indicate an advertised TTLM that will be established in the future. The value of the Expected Duration field of the (#19703)currently established TID-To-Link Mapping element shall indicate a remaining duration that ends at the same time as indicated by the Mapping Switch Time field of the (#19704)other TID-To-Link Mapping element.

(#20046)NOTE 3—If the currently advertised TTLM is going to be replaced by the default mapping, the AP MLD sets the Expected Duration field of the currently advertised TTLM element to the remaining time until the default mapping is established as described in 9.4.2.314 (TID-To-Link Mapping element). After the establishment of the default mapping, no TID-To-Link Mapping elements are included in the Beacon or Probe Response frames transmitted by the APs affiliated with the AP MLD.

All APs affiliated with an AP MLD that advertises a TTLM shall include the same mapping in all Beacon and Probe Response frames from the time at which the TTLM is first advertised until the time at which the TTLM is no longer advertised, and shall include the Expected Duration field in all TID-To-Link Mapping elements in Beacons. The Mapping Switch Time field should initially be set to a sufficiently large value (#20074)which is larger than two DTIM periods of the AP transmitting the frame carrying the field. After an advertised TTLM is established, the duration indicated by Expected Duration field shall indicate the time when the advertised TTLM is expected to end . During the advertisement of the TTLM the time indicated in the Expected Duration field may be updated to indicate an earlier time than initially indicated, but shall not be updated to indicate a later time than initially indicated. The duration indicated by Expected Duration field shall be exact when the duration is smaller than two DTIM periods of the AP transmitting the frame carrying the field.

At the time indicated by the Mapping Switch Time field of a TID-To-Link Mapping element in a Beacon or a Probe Response frame received by a non-AP STA affiliated with a non-AP MLD from an AP affiliated with its associated AP MLD, or at the time indicated by the Expected Duration field of an existing advertised TTLM which will be replaced by the default mapping, the non-AP MLD shall update its TTLM according to the rules that establish a TTLM in this subclause and with the consequences of the updated mapping defined in 35.3.7.2.1 (General) unless the current TTLM for the non-AP MLD is a negotiated TTLM and the enabled link set in the current mapping is a subset of the enabled link set in the advertised mapping.

A non-AP MLD applies the advertised TTLM only to the links that it has setup with the AP MLD during ML setup.

An individually negotiated TTLM whose negotiation was completed prior to the establishment of an advertised TTLM shall be discarded at the time of the establishment of the advertised TTLM if the enabled link set in the advertised TTLM is a subset of the enabled link set in the negotiated TTLM.

NOTE 4—A non-AP MLD ignores links that are included in the link mappings of an advertised TTLM that are not part of the non-AP MLD ML setup procedure. For example, if the AP MLD operates on links 1, 2, and 3, and it advertises that link 3 is disabled and all TIDs are mapped to links 1 and 2, then for a non-AP MLD that is associated with the AP MLD using links 1 and 2 the default mapping will apply. In this case, for a non-AP MLD that is associated with the AP MLD using links 1 and 3, link 3 will be disabled.

NOTE 5—In absence of an advertised mapping by the AP a default TTLM is assumed unless an individual TTLM is successfully negotiated.

A non-AP MLD shall not transmit a response frame to acknowledge the reception of an advertised TTLM. However a non-AP MLD may initiate a negotiation of a TTLM that maps all TIDs to a subset of the enabled links of the advertised TTLM by transmitting a TID-To-Link Mapping Request frame.

A non-AP MLD that is associated with an AP MLD that advertises a TTLM may initiate a negotiation for a TTLM that is different from the TTLM established from the advertisement as described in this subclause. The non-AP MLD or the AP MLD shall not initiate a negotiation for a TTLM that maps a TID to a link if the requested TID is not already mapped to the link in the advertised TTLM.

An example of TTLM frame exchange involving advertised mapping is shown in AF.5 (Example of TTLM frame exchange).

**AF.5 Example of TTLM frame exchange**

TGbe Editor: please add the following contents at the beginning of this subclause:

Figure AF-22a (An illustration of an advertised TTLM taking effect on all links) explains the procedure via an example consisting of an AP MLD having three affiliated APs with different DTIM intervals and with TBTTs that are not aligned.



**Figure AF-22a—An illustration of an advertised TTLM taking effect on all links**