IEEE P802.11
Wireless LANs

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| LB271 – CR for some CIDs related to 35.3.12.4 |
| Date: 2023-06-27 |
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Abstract

Spec text proposal for resolution of following CIDs for LB271 on 11be D3.0:

18161 16039 17959 17960 15542 18162 18163 15085 15632 15088 18165 16449 16044 17994 17995 16045 16536 16827 18166 18167 18257

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 18161 | 35.3.12.4 | 538.42 | An AP provides link recommendation for reasons such as load balancing. Such conditions are long term (several minutes or longer) and do no change from TBTT to TBTT (i.e., 100 ms). Therefore, delete all text related to link recommendation via a Beacon frame and keep one consistent scheme for link recommendation - which is via the Link Recommendation frame. | As in comment |   |
| 16039 | 35.3.12.4 | 538.47 | "The AP's indication may be carried in a broadcast or a unicast frame." - which indications this sentence is referring to? Is this for Link Recommendation frame? Pg 541 line 6 indicates that only broadcast LR frames are supported. Clarify in the text. | As in comment | Revised – everything can be done with Broadcast transmissions. Suppress the sentence indicating that the indication can be sent unicast. Apply the changes marked as #16039 in this document |
| 17959 | 35.3.12.3 | 538.47 | It says 'The AP's indication may be...' What is the indication? Does it refer to traffic indication? Please add the word 'traffic' before 'indication' | as the comment |  Revised – the changes from CID16039 is deleting this sentence, resolving this comment at the same time. Apply the changes marked as #16039 in this document |
| 17960 | 35.3.12.3 | 538.47 | As it says 'The AP's indication may be carried in a broadcast or a unicast frame',the beacon and Link Recommendation frame are both broadcast frame.What is the unicast frame.Please clarify it. | please add an instance of unicast frame | Revised – everything can be done with Broadcast transmissions. Suppress the sentence indicating that the indication can be sent unicast. Apply the changes marked as #17960 in this document |
| 15542 | 35.3.12.4 | 538.48 | Beacon shall be broadcast addressed, whilst Link Recommendation frame may be individually addressed or broadcast addressed. And the word "AP's indication" is not consistent with previous sentences. | Change: The AP's indication may be carried in a broadcast or a unicast frameTo: The Link Recommendation frame may be Individually addressed or broadcast addressed. | Revised – everything can be done with Broadcast transmissions. Suppress the sentence indicating that the indication can be sent unicast. Apply the changes marked as #15542 in this document |
| 18162 | 35.3.12.4 | 538.48 | The term indication is being used in the context of traffic indication in this subclause. Therefore, 'indication' can be confused with traffic indication. | Replace 'indication' with 'recommendation' |  Revised – the changes from CID16039 is deleting this sentence, resolving this comment at the same time. Apply the changes marked as #16039 in this document |
| 18163 | 35.3.12.4 | 539.01 | The spec text in this clause has been utterly confusing to understand since we mixing link recommendation and traffic announcement (via the beacon frame). What is the benefit of recommending links via the Beacon frame (thru ML Traffic IE) when we have a dedicated frame for the same purpose? | Remove all text related to link recommendation via a Beacon frame and keep one consistent scheme for link recommendation - which is via the Link Recommendation frame. |   |
| 15085 | 35.3.12.4 | 539.25 | Revise the paragraph into 3 sentences for better readability. | Please revise the paragraph as follows:"If a non-AP MLD is in the default mapping mode (see 35.3.7.1.2 (Default mapping mode)) or all TIDs are mapped to all enabled links, the bit position i of the Per-Link Traffic Indication Bitmap subfield that corresponds to the link with the link ID equals to i on which a non-AP STA affiliated with the non-AP MLD is operating may be set to 1 to indicate to the non-AP MLD a link on which buffered BU(s) should be retrieved.A non-AP MLD that successfully negotiated a TID-to-link mapping with an AP MLD and not all TIDs are mapped to all enabled links shall determine which AP has buffered BU(s) with TID(s) by interpreting a Multi-Link Traffic Indication element.An example of the construction of the Multi-Link Traffic Indication element is shown inFigure 35-22 (Example of Multi-Link Traffic Indication element construction). " | Revised – this text has already been changed with CID15083 and is captured in 802.11be draft 3.2. No more actions needed for this CID.Apply the changes marked as #15083.  |
| 15632 | 35.3.12.4 | 539.31 | AP MLD announces buffer status for all Non-AP MLDs (non-default mapping) with only one Multi-link Traffic indication element ?There will be several types of Non-AP MLDs each of which support different number of links in the future. For example there will be Non-AP MLDs with only legacy band (2.4/5GHz) while there will be Non-AP MLDs with new band (2.4/5/6GHz), moreover it is expected Non-AP MLDs support mmWave.More specific example is that low-end Non-AP MLD may support only two links while high-end Non-AP MLD may support five links larger than low-end one. Both low-end ones and high-end ones share one Multi-link Traffic indication element may not be efficient.Hopefully separate low-end one and high-end one into different Multi-link Traffic indication element according to supported links | as in comment | Reject – the commenter failed to identify a technical issue.  |
| 15088 | 35.3.12.4 | 540.54 | In the following sentence, since the AID Bitmap element indicates Per-Link Traffic Indication Bitmap subfiels included in the Multi-Link Traffic Indication element in the Link Recommendation frame, the AID Offset subfield is not needed:"-- The Multi-Link Traffic Indication element includes Per-Link Traffic Indication Bitmap subfield(s), in the Per-Link Traffic Indication Bitmap List field, which correspond(s) to the AID(s) of the nonAP MLD(s), starting from the bit number k of the AID bitmap of the AID Bitmap element carried in the Link Recommendation frame. The AID Offset subfield of the Multi-Link Traffic Control field of the Multi-Link Traffic Indication element contains the value k. The order of the ... " | Revise the sentence as follows by deleting the part related to the AID Offset subfield and k:"-- The Multi-Link Traffic Indication element includes Per-Link Traffic Indication Bitmap subfield(s), in the Per-Link Traffic Indication Bitmap List field, which correspond(s) to the AID(s) of the non-AP MLD(s) indicated in the Partial AID Bitmap subfield of the AID Bitmap element carried in the Link Recommendation frame. The order of the ..."Also make the following change in 9.4.2.315 (Multi-Link Traffic Indication element) in P294L34:"The AID Offset subfield indicates a bit numbered k of the traffic indication virtual bitmap when the Multi-Link Traffic Indication element is included in the Beacon frame. When the Multi-Link Traffic Indication element is included in the Link Recommendation frame, the AID Offset subfield is reserved." | Reject - This CID was discussed on March 15, 2023, but the proposal didn’t reach sufficient support |
| 18165 | 35.3.12.4 | 540.55 | Is the 'k' based on AID Offset of ML Traffic IE or offset from the AID Bitmap IE? Please clarify. | As in comment | Reject - This CID was discussed on March 15, 2023, but the proposal didn’t reach sufficient support. |
| 16449 | 35.3.12.4 | 540.58 | There is not real need for AID offset in the case of link recommendation frame cause the range of STAs is already defined in the AID Bitmap element. | Make the AID offset reserved in that situation | Reject - This CID was discussed on March 15, 2023, but the proposal didn’t reach sufficient support. |
| 16044 | 35.3.12.4 | 541.10 | Is a non-AP ML required to support LR frame? If not how does an AP MLD know whether a non-AP MLD supports LR frames? There is no capability bit for Link Recommendation. | Add a capability bit for Link Recommendation. | Reject – support is mandatory.  |
| 17994 | 35.3.12.4 | 541.10 | A mechanism should be provided for an AP affiliated with an AP MLD to recommend to a STA affiliated with a non-AP MLD to wake up STAs operating on other links to receive BUs when the traffic buffer at AP MLD is large. | Suggest to incorporate changes in proposal 11-22/1201r6 to resolve this issue. | Reject - This CID was discussed on March 15, 2023, but the proposal didn’t reach sufficient support. |
| 17995 | 35.3.12.4 | 541.10 | An AP MLD should be allowed to transmit a BSR to an associated non-AP MLD to assist the non-AP MLD to more efficiently perform multi-link power management. | Allow a STA affiliated with a non-AP MLD to transmit a BSRP to an AP it is associated with. Allow an AP of an AP MLD to include a BSR or BSR control field in a frame it transmits to a STA of a non-AP MLD. |  Reject – the proposal didn’t reach sufficient support. |
| 16045 | 35.3.12.4 | 541.18 | The dot11MultiLinkTrafficIndicationActivated MIB is not used in any other place in the draft. This MIB is also not defined in Annex C. | Add text specifying use of the dot11MultiLinkTrafficIndicationActivated MIB and add MIB definition. | Revised – add description for the MIB variable in annex C. The MIB is otherwise used in the Beacon frame description to determine if the Multi-Link Traffic Indication is included or not. Apply the changes marked as #16045 in this document  |
| 16536 | 35.3.12.4 | 541.18 | The requirement to set the dot11MultiLinkTrafficIndicationActivated is not clear, since this MIB variable is not used anywhere in the 802.11be specification. | Please remove the requirement (and the MIB variable) or clarify where this variable is used. | Revised – add description for the MIB variable in annex C. The MIB is otherwise used in the Beacon frame description to determine if the Multi-Link Traffic Indication is included or not. Also clarify the requirement for when this is included. Apply the changes marked as #16536 in this document  |
| 16827 | 35.3.12.4 | 541.18 | "and if" could be misinterpreted as two separate conditions, either of which can be met | Change to "and" | Revised – agree with the commenter. The first condition doesn’t seem right anyway. Apply the changes marked as #16827 in this document.  |
| 18166 | 35.3.12.4 | 541.19 | Move the text related to otherwise after all the bullets since the bullets capture the condition when the MIB is set to true. | As in comment | Revised – agree with the commenter. Apply the changes marked as #18166 in this document.  |
| 18167 | 35.3.12.4 | 541.19 | What is the benefit of recommending links via the Beacon frame when we have a dedicated frame for the same purpose? | Delete the 2nd and 3rd bullets |   |
| 18257 | 35.3.12.4 | 541.23 | not all TIDs aremapped to all the enabled links (i.e., TID-to-link Mapping Negotiation Supported subfield set to 1) | change to “i.e. TID-to-link Mapping Negotiation Supported subfield set to 3” | Reject – the language is meant to be more generic.  |

1. **Introduction**
2. **Proposed spec text**
	* + 1. **Traffic indication**

Tgbe editor: Modify the following paragraph as follows:

An AP MLD may use (#16820)the Multi-Link Traffic Indication element and the TIM element carried in a Beacon frame to recommend a non-AP MLD to use one or more enabled links to retrieve individually addressed buffered BU(s). An AP MLD may also use the Multi-Link Traffic Indication element and the AID Bitmap element in a Link Recommendation frame to recommend a non-AP MLD to use one or more enabled links for all exchanges both for DL and UL (#15871)as described in [35.3.7.4 (Link](#_bookmark43) [recommendation(#15871))](#_bookmark43). (#16039, #17960, #15542)

Tgbe editor: Modify the following paragraph as follows (#16045, #16536):

(#15871)An AP MLD shall set dot11MultiLinkTrafficIndicationActivated to true (#16827 if any of the following conditions is met(#18166) :

* At least one (#15919)associated non-AP MLD does not have all TIDs mapped to all the enabled links and the AP MLD has buffered BU(s) with TID(s) that are not mapped to all enabled links for that non-AP MLD.
* The AP MLD intends to provide link recommendations in a Beacon frame to retrieve individually addressed buffered BUs to at least one (#15919)associated non-AP MLD that has all TIDs mapped to all the enabled links and the AP MLD has buffered BU(s) for that non-AP MLD.

(#18166) Otherwise the AP MLD shall set dot11MultiLinkTrafficIndicationActivated to false.

**C.3 MIB Detail**

Tgbe editor: Modify the following paragraph as follows (#16045, #16536):

Dot11EHTStationConfigEntry ::= SEQUENCE {

dot11EHTPPEThresholdsRequired TruthValue,

dot11TIDtoLinkMappingActivated TruthValue,

dot11EHTEPCSPriorityAccessActivated TruthValue,

dot11MSDTimerDuration Unsigned32,

(#16903)dot11MSDTXOPMax Unsigned32,

dot11MultiLinkActivated TruthValue,

dot11MLDAssociationSAQueryMaximumTimeout Unsigned32,

dot11EHTMCSFeedbackOptionImplemented INTEGER,

dot11EHTEMLSROptionImplemented TruthValue,

dot11EHTEMLSROptionActivated TruthValue,

dot11EHTEMLMROptionImplemented TruthValue,

dot11EHTEMLMROptionActivated TruthValue,

dot11OperationParameterUpdateImplemented TruthValue, (#15985)dot11EHTLinkReconfigurationOperationActivated TruthValue,

dot11MultiLinkTrafficIndicationActivated TruthValue

}

Tgbe editor: Insert the following paragraph after the paragraph starting with dot11EHTLinkReconfigurationOperationActivated as follows (#16045, #16536):

dot11MultiLinkTrafficIndicationActivated OBJECT-TYPE SYNTAX TruthValue

MAX-ACCESS read-write STATUS current DESCRIPTION

"This is a control variable.

It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation.

This attribute, when true, indicates that the AP affiliated with an AP MLD includes a Multi-Link Traffic Indication element in the Beacon frames that it transmits. If the attribute is false, the AP doesn’t include the Multi-Link Traffic Indication element in the Beacon frames that it transmits."

DEFVAL { false }

::= { dot11EHTStationConfigEntry 14 }