IEEE P802.11
Wireless LANs

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| SA ballot CR for TTLM element |
| Date: 2024-03-12 |
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Abstract

This submission proposes resolution of a comment received from TGbe comment collection based on TGbe D5.0 SA ballot. (CID provided with reference to document 11-24-0254)

* 22352

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Update after 1st presentation on March 27th. SP1 is removed, SP2 is kept.
1. **Introduction**

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. The introduction and the explanation of the proposed changes are 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 802.11be 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**  | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 22352 | Alfred Asterjadhi | 9.4.2.314 | 293.24 | [Mikael Lorgeoux] When all TIDs are mapped to the same link set, the TID-To-Link Mapping element shall include the same Link Mapping Of TID n fields for each TID value (0 to 7). For advertised TID-to-link mapping operation for which the TID-To-Link Mapping element is included in the beacon, the overhead of this signaling can result in the beacon bloating problem. | Reduce the overhead of TID-to-Link Mapping element when all TIDs are mapped to the same link set. The commenter will bring a contribution. | Revised.Agree with the commenter. Proposed resolution addresses the suggested change TGbe editor to make the changes shown in 24/0261r1 under all headings that include CID 22352. |

**Discussion:**

This document proposes a solution to reduce the overhead of the TID-To-Link Mapping element sent in Beacon or Probe Response frames when all TIDs are mapped on the same link set (TTLM mode 1).

Comment Resolution (#22352):

* This CR applies to Advertised TTLM procedure only, no change for the Negotiated TTLM procedure.
* In the TTLM element, one field is modified:
	+ The Link Mapping Of TID 0 field is replaced by a Link Mapping of All TIDs / Link Mapping Of TID 0 field.
* The new proposed signaling is based on a specific signaling operation for the Advertised TTLM procedure, i.e., when the TTLM element is transmitted in a Beacon or Probe Response frame by an AP affiliated with an AP MLD. This signaling operation relies on the fact that, in an advertised TTLM, all TIDs shall be mapped to the same link set, as stated in 11be draft v5.0.

The table below highlights the gain in terms of overhead reduction for proposed solution.

|  |  |  |  |
| --- | --- | --- | --- |
|  | .11be draft 5.0(2B/1B Link Mapping Size) | CR (#22352)(2B/1B Link Mapping Size) | Comments |
| Advertised TTLM mode 1 | 10B + 8\*2B /10B + 8\*1B | 10B + 1\*2B /10B + 1\*1B | Solution gain = 14B / 7B |
| Negotiation TTLM mode 1 | 5B + 8\*2B /5B + 8\*1B | 5B + 8\*2B /5B + 8\*1B | Solution gain = 0B / 0B |

In this table, the following assumptions are considered:

* TTLM mode 1 corresponds to the TTLM case where all TIDs are mapped to the same link set.
* In the Advertised TTLM mode 1 row, an advertised TTLM not yet established is considered (i.e., Mapping Switch Time and Expected Duration fields are present).
* In the table, the gain of proposed solution is estimated for a Beacon or Probe Response frame including one TTLM element and transmitted by one affiliated AP. These overhead gains could be even higher when 2 TTLM elements are sent in a Beacon or Probe response frame and when the advertised TTLM is transmitted by several affiliated APs.

**Straw Poll:**

Do you agree to resolve the following CID listed in 11-24/0261r1 and incorporate the text changes into the latest TGbe draft ? (Y, N, Abstain)

* 22352

* + - 1. **TID-To-Link Mapping element**

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***TGbe Editor to make the following changes in Figure 9-1001ao, Figure 9-1001ap and related description – TID-To-Link Mapping element (#22352):***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element IDExtension | TID-To-Link Mapping Control | Mapping Switch Time | Expected Duration | Link Mapping Of All TIDs / Link Mapping Of TID 0(Optional) | … | Link Mapping Of TID 7(Optional) |

Octets: 1 1 1 1 or 2 0 or 2 0 or 3 0, 1 or 2 0, 1 or 2

**Figure 9-1001ao—TID-To-Link Mapping element format**

…

 B0 B1 B2 B3 B4 B5 B6 B7 B8 B15

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Direction | Default Link Mapping | Mapping Switch Time Present | Expected Duration Present | Link Mapping Size | Reserved | Link Mapping Presence Bitmap (Optional) |

Bits: 2 1 1 1 1 2 0 or 8

**Figure 9-1001ap—TID-To-Link Control field format**

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(#22352) When the TID-To-Link Mapping element is transmitted in other frames than Beacon or Probe Response frame, the Default Link Mapping subfield is set to 1 if the TID-To-Link Mapping element represents the default TTLM. Otherwise, the subfield is set to 0.

(#22352) When the TID-To-Link Mapping element is transmitted in a Beacon or Probe Response frame, the Default Link Mapping subfield behaves as follows:

* The Default Link Mapping subfield is set to 1 if the TID-To-Link Mapping element represents the default TID-to-link mapping. If this setting is used, the Link Mapping Of All TIDs field, the Link Mapping Of TID n field (with n=1, ..., 7) and the Link Mapping Presence Bitmap subfield are not present.
* The Default Link Mapping subfield is set to 0 if the TID-To-Link Mapping element represents a TID-to-link mapping where all TIDs are mapped to the same link set (where the link set is a subset of setup links). If this setting is used, the Link Mapping Of All TIDs field is present and the Link Mapping Of TID n fields (with n=1, ..., 7) are not present. If this setting is used, the Link Mapping Presence Bitmap subfield may be present with a predefined value (e.g., x80) to indicate the presence of Link Mapping Of All TIDs field.

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(#22352) The Link Mapping Size subfield is set to 1 if the length of the Link Mapping Of All TIDs / Link Mapping Of TID 0 field and the length of the Link Mapping Of TID *n* field (with n=1, ..., 7) is 1 octet and is set to 0 if the length of the Link Mapping Of All TIDs / Link Mapping Of TID 0 field and the length of the Link Mapping Of TID *n* field (with n=1, ..., 7) is 2 octets.

(#22352) When the TID-To-Link Mapping element is transmitted in other frames than Beacon or Probe Response frame, the Link Mapping Presence Bitmap subfield indicates which theLink Mapping Of TID *n* fields (with n=0, …, 7) are present in the TID-To-Link Mapping element (i.e., the subfield identifies the TID(s) for which the mapping is provided in the element). A value of 1 in bit position *n* of the Link Mapping Presence Bitmap subfield indicates that the Link Mapping Of TID *n* field is present in the TID-To-Link Mapping element. Otherwise, the Link Mapping Of TID *n* field is not present in the TID-To-Link Mapping element.

(#22352) When the TID-To-Link Mapping element is transmitted in a Beacon or Probe Response frame, the Link Mapping Presence Bitmap subfield may be present with a predefined value (e.g., x80) to indicate the presence of the Link Mapping Of All TIDs field.

(#22352)When the Default Link Mapping subfield is set to 1, the Link Mapping Presence Bitmap subfield is not present.

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(#22352) The Link Mapping Of All TIDs / Link Mapping Of TID 0 field corresponds to the Link Mapping Of All TIDs field when the TID-To-Link Mapping element is transmitted by an AP affiliated with an AP MLD in a Beacon or Probe Response frame. Otherwise, the Link Mapping Of All TIDs / Link Mapping Of TID 0 field corresponds to the Link Mapping Of TID 0 field.

(#22352) When the TID-To-Link Mapping element is transmitted in other frames than Beacon or Probe Response frame, the Link Mapping Of TID n field (where n= 0, 1, …, 7 ) indicates the link(s) on which frames belonging to TID n are allowed to be sent (i.e., carries a bitmap of the links to which the TID n is mapped to). A value of 1 in bit position i (where i = 0, 1, …, 7 if the Link Mapping Size subfield is set to 1, and i = 0, 1, …, 14 otherwise) of the Link Mapping Of TID n field indicates that TID n is mapped to the link associated with the link ID i for the direction as specified in the Direction subfield. A value of 0 in bit position i indicates that the TID n is not mapped to the link associated with the link ID i for the direction as specified in the Direction subfield. When the Default Link Mapping subfield is set to 1, no Link Mapping Of TID n field is present.

(#22352) When the TID-To-Link Mapping element is transmitted in a Beacon or Probe Response frame, the Link Mapping Of All TIDs field behaves as follows:

* If the Default Link Mapping subfield is set to 0, the Link Mapping Of All TIDs field indicates the link(s) on which frames belonging to any TIDs are allowed to be sent (i.e., carries a bitmap of the links to which all TIDs are mapped to). A value of 1 in bit position *i* (where *i*=0, 1, …, 7 if the Link Mapping Size subfield is set to 1, and i=0, 1, …, 14 otherwise) of the Link Mapping Of All TIDs field indicates that all TIDs are mapped to the link associated with the link ID *i* for the direction as specified in the Direction subfield. A value of 0 in bit position *i* indicates that no TID is mapped to the link associated with the link ID *i* for the direction as specified in the Direction subfield. The bitmap of the links on which all TIDs are mapped to should be set to a value where at least one of the bits corresponding to one of the setup links is set to 0, meaning that at least one of the setup link is disabled. When the Default Link Mapping subfield is set to 0, no Link Mapping Of TID n field (with n=1, ..., 7) is present.
* If the Default Link Mapping subfield is set to 1 (i.e., corresponding to the Default TID-to-link mapping), the Link Mapping Of All TIDs field and the Link Mapping Of TID n fields (with n=1, ..., 7) are not present.