IEEE P802.11
Wireless LANs

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| 11be Spec text for TID Mapping Negotation |
| Date: 2021-01-18 |
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Abstract

We propose the draft text related to TID mapping negotiation to help the creation of TGbe draft D0.4.

The discussion related to the proposed texts can be found in doc [11-20/1044r2](https://mentor.ieee.org/802.11/dcn/20/11-20-1044-02-00be-mlo-tid-to-link-mapping-negotiation.pptx)

Revisions:

* Rev 0: Initial version of the document.

**Proposed spec text:**

The baseline for this text is 802.11be D0.3.

* **TID-to-link mapping**

***TGbe editor: Please make changes to the following paragraphs this subclause as follows:***

* **General**

The TID-to-link mapping mechanism allows an AP MLD and a non-AP MLD that performed multi-link setup to determine how TIDs are mapped to the setup links in DL and in UL. When a TID is mapped to one or more links, frames belonging that TID shall not be transmitted on the link(s) to which the TID is not mapped.

By default, all TIDs shall be mapped to all setup links for both UL and DL (see 35.3.6.1.2 (Default mapping mode)).

If an MLD supports TID-to-link mapping negotiation, it shall set the TID Mapping Negotiation Supported subfield to 1 in the EHT MAC Capabilities Information field of the EHT Capabilities element that it transmits.

When either MLD does not support TID-to-link mapping negotiation, the MLDs shall operate in default mapping mode (see 35.3.6.1.2 (Default mapping mode)).

When both MLDs have indicated support for TID mapping and have not explicitly negotiated a mapping by following the procedure defined in 35.3.6.1.3 (Negotiation of TID-to-link mapping) or either MLD has torndown the mapping for all the TIDs, the MLDs shall operate in default mapping mode (see 35.3.6.1.2 (Default mapping mode)).

A setup link is defined as enabled if at least one TID is mapped to that link and is defined as disabled if no TIDs are mapped to that link. At any point in time, a TID shall always be mapped to at least one setup link, unless admission control is used. By default, as TIDs are mapped to all setup links, all setup links shall be enabled (see 35.3.6.1.2 (Default mapping mode)).

If a link is enabled, it may be used for frame exchange, subject to the power state of the non-AP STA operating on that link. Frames carrying MSDUs or A-MSDUs with TIDs mapped to an enabled link may be transmitted on that link. Frames carrying MSDUs or A-MSDUs with TIDs not mapped to a link shall not be transmitted on that link. Management frames may be sent on enabled links, following baseline.

* ***“following baseline” is not precise. Please update it with an appropriate reference of IEEE P802.11REVmd D4.0.***

If a link is disabled, it shall not be used for frame exchange, including Management frames.

If a link is enabled, it may be used for frame exchange, subject to the power state of the non-AP STA operating on that link. Frames carrying MSDUs or A-MSDUs with TIDs mapped to an enabled link may be transmitted on that link. Frames carrying MSDUs or A-MSDUs with TIDs not mapped to a link shall not be transmitted on that link. Management frames may be sent on enabled links, following baseline.

If a TID is mapped in DL to a set of enabled links for a non-AP MLD, then:

* The non-AP MLD can retrieve buffered BUs corresponding to that TID on any links within this set of enabled links.
* The AP MLD can use any link within this set of enabled links to transmit frames carrying MSDUs or A-MSDUs with that TID, subject to existing restrictions for transmissions of frames that apply to those enabled links.

If a link is enabled, it may be used for frame exchange, subject to the power state of the non-AP STA operating on that link. Frames carrying MSDUs or A-MSDUs with TIDs mapped to an enabled link may be transmitted on that link. Frames carrying MSDUs or A-MSDUs with TIDs not mapped to a link shall not be transmitted on that link. Management frames may be sent on enabled links, following baseline.

NOTE 2—An example of restriction is if the STA is in doze state.

NOTE 3—If the default mode is used, all TIDs are mapped to all links and all links are therefore enabled. The non-AP MLD can have the corresponding non-AP STA wake up on any link to receive BUs buffered by the AP MLD. The non-AP MLD can therefore use the power state of its non-AP STAs to dynamically change the links it wants to operate on.

* **Default mapping mode**

Under this mode, all TIDs are mapped to all links for DL and UL, and all setup links are enabled. A non-AP MLD and an AP MLD that performed multi-link setup shall operate under this mode if a TID-to-link mapping negotiation for a different mapping did not occur or was not successful or was torn down.

* Negotiation of TID-to-link mapping

***TGbe editor: Please add the following paragraphs to this subclause as shown below:***

To setup a TID-to-link mapping, an MLD shall send an individually addressed TID-Mapping Request frame to a peer MLD with which it has performed multi-link setup and has indicated supported for TID-to-link mapping negotiation.

The recipient MLD shall respond with an individually addressed TID-Mapping Response frame. If the mapping is acceptable, the recipient MLD shall indicate that it has accepted the mapping. Otherwise, the recipient MLD shall indicate rejection of the proposed mapping.

An MLD may transmit an unsolicited TID-Mapping Response frame to suggest a preferred mapping.

An MLD should take into account the preferred mapping (if indicated by the peer MLD) when it initiates a new mapping.

In addition, an AP MLD should take into account the traffic flow(s) affiliated with the non-AP MLD and the capabilities and constraints (if any) of the non-AP MLD.

NOTE – A non-AP MLD can indicate its constraints (such as single radio) during multi-link setup.

A multi-link multi-radio (MLMR) non-AP MLD should accept a mapping initiated by its associated AP MLD.

When two MLDs have negotiated a TID-mapping, either MLD may teardown the negotiated mapping by sending an individually addressed TID-Mapping Teardown frame. After teardown, the MLDs shall operate in default mapping mode (see 35.3.6.1.2 (Default mapping mode)).

* Action frame format details

***Insert the following new subclause at the end of subclause 9.6:***

* TID-Mapping Action frame details

The format of TID Mapping Request/Response/Teardown frames is TBD

* EHT Capabilities element

***Insert the following subclause along with text and figure as shown below:***

9.4.2.247c.1 General

An EHT STA declares that it is an EHT STA by transmitting the EHT Capabilities element.

The EHT Capabilities element contains fields that are used to advertise the EHT capabilities of an EHT STA. The EHT Capabilities element is defined in Figure 9-xxx (EHT Capabilities element format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | EHT MAC Capabilities Information | EHT PHY Capabilities Information |
| Octets: | 1 | 1 | 1 | 6 | 11 |
| Figure 9-xxxa – EHT Capabilities element format |

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The EHT MAC Capabilities Information and EHT PHY Capabilities Information fields are defined in the subclauses below.

9.4.2.247c.2 EHT MAC Capabilities Information field

The format of the EHT MAC Capabilities Information field is defined in Figure 9-xxxb (EHT MAC Capabilities Information field format).

|  |  |  |
| --- | --- | --- |
|  | TID Mapping Negotiation Supported | Reserved |
| Octets: | 1 | TBD |
| Figure 9-xxxb – EHT Capabilities element format |

The subfields of the EHT MAC Capabilities Information field are defined in Table 9-xxx (Subfields of the EHT MAC Capabilities Information field).

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| Table 9-xxx – Subfields of the EHT MAC Capabilities Information field  |
| Subfield | Definition | Encoding |
| TID Mapping Negotiation Supported | Indicates support for TID-to-link mapping negotiation | Set to 1 if the MLD with which the transmitting STA is affiliated with supports TID-to-link mapping negotiation as described in 35.3.6.1.3 (Negotiation of TID-to-link mapping).Set to 0 otherwise. |

9.4.2.247c.3 EHT PHY Capabilities Information field