IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB275 Comment Resolution – Miscellaneous CIDs | | | | |
| Date: 2023-10-31 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Minyoung Park | Intel Corporation |  |  | Minyoung.park@intel.com |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes comment resolution(s) for the following 6 CID(s) received in LB275 on TGbe D4.0 related to the 3.2 and 35.12.4:

CIDs:

19127 19473 19475 19851 19213 19584

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: updated resolutions for CID 19851 and 19213

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 19127 | Bo Sun | 3.2 | 59.06 | "Setup link" is defined as links between AP MLD and non-AP MLD. Then why "disabled link" only makes sense to non-AP mld by only mentioning "non-AP MLD" in its definition? | Please clarify or improve the definition | Revised.  In TGbe D4.1, 35.3.5.1 ML (re)setup procedure, a setup link is defined as follows: “A link that is requested by the non-AP MLD for (re)setup in the (Re)Association Request frame and is accepted by the AP MLD in the (Re)Association Response frame (#19056)and is not removed (see 35.3.6.3 (Removing affiliated APs)) or deleted (see 35.3.6.4 (ML reconfiguration to the ML setup)) at a later time is a setup link between the AP MLD and the associated non-AP MLD.”  TGbe editor to make the changes with the CID tag (#19127) in doc.: IEEE 802.11-23/1803r1  [https://mentor.ieee.org/802.11/dcn/23/11-23-1803-01-00be-lb275-cr-misc.docx] |
| 19473 | Stephen McCann | 3.2 | 57.26 | typo "are in awake" | Change "are in awake" to "are in an awake" | Revised.  In LB271, CID16258, the commenter proposed to change ‘awake state’ to ‘the awake state’ throughout the spec. and the resolution was approved. Since there is only one awake state defined in the baseline standard, ‘the awake state’ seems correct.  TGbe editor to make the changes with the CID tag (#19473) in doc.: IEEE 802.11-23/1803r1  [https://mentor.ieee.org/802.11/dcn/23/11-23-1803-01-00be-lb275-cr-misc.docx] |
| 19475 | Stephen McCann | 3.2 | 57.34 | An indefinie article for "awake" should be used within this definition. | Change "are in the awake" to "are in an awake" | Rejected.  In LB271, CID16258, the commenter proposed to change ‘awake state’ to ‘the awake state’ throughout the spec. and the resolution was approved. Since there is only one awake state defined in the baseline standard, ‘the awake state’ seems correct. |

**TGbe Editor to make changes in Subclause 3.2 in TGbe D4.1**

**disabled link:** A setup link (#19127)between an AP MLD and an associated non-AP MLD to which no TID is mapped neither in downlink nor in uplink (see 35.3.7.2 (TID-To-Link Mapping (TTLM)(#19941))).

…

**enabled link:** A setup link (#19127)between an AP MLD and an associated non-AP MLD to which at least one TID is mapped either in downlink or in uplink (see 35.3.7.2 (TID-To-Link Mapping (TTLM)(#19941))).

…

**enhanced multi-link multi-radio (EMLMR) operation:** [EMLMR operation] A mode of operation that allows a non-access point (non-AP) multi-link device (MLD) with multiple receive chains to listen on a set of enabled links when the corresponding (#19474)non-AP stations (STAs) affiliated with the non-AP MLD are in (#19473)the awake state for an initial frame sent by an AP affiliated with an AP MLD to one of the receiving non-AP STAs in a physical layer (PHY) protocol data unit (PPDU) whose Nss satisfy that receiving non-AP STA’s receiving capabilities, followed by frame exchanges that satisfy the MCS, Nss capabilities in EMLMR mode on the link on which the initial frame was received.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 19851 | Vishnu Ratnam | 35.3.12.4 | 543.46 | A mechanism should be provided in the traffic indication procedure, for an AP affiliated with an AP MLD to recommend one or more non-AP MLD(s) with default TTLM to wake up STAs operating on all links to receive BUs when the traffic buffer at AP MLD is large. | When a non-AP MLD that is in the default mapping mode detects that the bit corresponding to its AID is equal to 1 in the TIM element and the Multi-Link Traffic Indication element is present in a Beacon frame and the Multi-Link Traffic Indication element includes a Per-Link Traffic Indication Bitmap n subfield that corresponds to the non-AP MLD, the non-AP MLD shall operate as follows: (i) if all bits of the Per-Link Traffic Indication Bitmap n subfield are set to 0, all non-AP STAs affiliated with the non-AP MLD should issue a PS-Poll frame, or a U-APSD trigger frame if the STA is using U-APSD and all ACs are delivery enabled, to retrieve buffered BU(s) from the AP MLD. (ii) if not all bits of the Per-Link Traffic Indication Bitmap n subfield are set to 0, any non-AP STA affiliated with the non-AP MLD that operates on the link(s) indicated as 1 in the Per-Link Traffic Indication Bitmap n subfield may issue a PS-Poll frame, or a U-APSD trigger frame if the STA is using U-APSD and all ACs are delivery enabled, to retrieve buffered BU(s) from the AP MLD. | Revised.  A mechanism to wake up STAs operating on other links affiliated with a non-AP MLD was discussed in the previous round but no consensus could be reached. Please see doc: 11-22/1201r6.  Clarification is made for the default mapping case when all bits in the Per-Link Traffic Indication Bitmap n subfield are equal to 0.  TGbe editor to make the changes with the CID tag (#19851) in doc.: IEEE 802.11-23/1803r1  [https://mentor.ieee.org/802.11/dcn/23/11-23-1803-01-00be-lb275-cr-misc.docx] |
| 19213 | Sanghyun Kim | 35.3.12.4 | 543.55 | Even if a non-AP MLD has successfully negotiated TID-to-Link mapping, the Per-Link Traffic Indication subfield might not be indicated depending on the TID of the BU for that non-AP MLD. It is neccessary adding a rule for the non-AP MLD that has successfully negotiated TID-to-link mapping and does not receive ML-TIM element. | Please add the following rule:  When a non-AP MLD that has successfully negotiated TID-to-link mapping and not all TIDs are mapped to all the enabled links detects that the bit corresponding to its AID is equal to 1 in the TIM element and does not receive the corresponding Per-Link Traffic Indication Bitmap subfield, any non-AP STA affiliated with the non-AP MLD may issue a PS-Poll frame, or a U-APSD trigger frame if the STA is using U-APSD and all ACs are delivery enabled, to retrieve buffered BU(s) from the AP MLD. | Revised.  Agree in principle. Deleted ‘that is in the default mapping mode’ in the paragraph in P553L31 so that this paragraph can apply to any non-AP MLD that detects its corresponding TIM bit is set to 1 in TIM element and there is no MLTI element or the corresponding Per-Link Traffic Indication Bitmap n subfield.  Also added the ‘all TIDs mapped to all enabled links’ in the paragraph (P543L46) for the link recommendation case.  TGbe editor to make the changes with the CID tag (#19213) in doc.: IEEE 802.11-23/1803r1  [https://mentor.ieee.org/802.11/dcn/23/11-23-1803-01-00be-lb275-cr-misc.docx] |
| 19584 | Juseong Moon | 35.3.12.4 | 543.36 | The current U-APSD operation of the 11be draft lacks the behavior of receiving a delivery-enabled AC from an AP MLD when a non-AP MLD transmits a trigger-enabled AC without receiving a TIM element from the AP MLD. Current draft should consider the operation about when the non-AP MLD sends a trigger-enabled AC U-APSD trigger frame to the AP MLD, the AP MLD indicates the link for which a delivery-enabled AC will be sent to the non-AP STA. | As in comment. | Rejected.  Current spec doesn’t prevent a non-AP STA affiliated with a non-AP MLD to transmit a U-APSD trigger frame without receiving the TIM element. |

**TGbe Editor to make changes in Subclause 35.3.12.4, P553L31 in TGbe D4.1(**#19851, 19213**):**

When a non-AP MLD detects that the bit corresponding to its AID is equal to 1 in the TIM element and if one of the following conditions is met, any non-AP STA affiliated with the non-AP MLD may issue a PS-Poll frame, or a U-APSD trigger frame if the STA is using U-APSD and all ACs are delivery enabled, to retrieve buffered BU(s) from the AP MLD:

* The Multi-Link Traffic Indication element is not present in a Beacon frame
* The Multi-Link Traffic Indication element is present in a Beacon frame but does not include a Per-Link Traffic Indication Bitmap *n* subfield that corresponds to the non-AP MLD
* (#19851)The Multi-Link Traffic Indication element is present in a Beacon frame and includes a Per-Link Traffic Indication Bitmap *n* subfield that corresponds to the non-AP MLD with all bits set to 0

When a non-AP MLD that is in the default mapping mode (see 35.3.7.2.2 (Default mapping mode)) (#19213)or has all TIDs mapped to all enabled links detects that the bit corresponding to its AID is equal to 1 in the TIM element and the Multi-Link Traffic Indication element is present in a Beacon frame and the Multi-Link Traffic Indication element includes a Per-Link Traffic Indication Bitmap *n* subfield that corresponds to the non-AP MLD, any non-AP STA affiliated with the non-AP MLD that operates on the link(s) indicated as 1 in the Per-Link Traffic Indication Bitmap *n* subfield may issue a PS-Poll frame, or a U-APSD trigger frame if the STA is using U-APSD and all ACs are delivery enabled, to retrieve buffered BU(s) from the AP MLD.