IEEE P802.11  
Wireless LANs

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| CR for CIDs Related to STA MAC Address of Non-AP MLD | | | | |
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Abstract

This submission proposes resolutions for CIDs 2297and 2489 on TGbe D0.3 regarding the STA MAC address of the non-AP MLD.

Revisions:

- Rev 0: Initial version of the document.

**Introduction**

***Editing instructions formatted like this are intended to be copied into the TGbe Draft 0.4 (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** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2297 | Michael Montemurro | 128.46 | 35.3.3 | This should not be a requirements for a STA affiliated with a non-AP MLD since the MAC address of the AP affiliated with the non-AP MLD is different and links are based on link pairs of MAC addresses. | At cited location, delete "each non-AP STA affiliated with the non-AP MLD shall have different MAC addresses" | **Revised**  Agree in principle with the commenter. The nan-AP MLD can use a single MAC address, i.e. the non-AP MLD MAC address is the same as the MAC address of any affiliated STA. So a corresponding Nontransparent subfield is added in the MLD Capabilities field.  **TGbe editor to make the changes shown in 11-21/****0594r0 tagged as 2297** |
| 2489 | Po-Kai Huang | 75.44 | 9.4.2.295b.2 | Each Per-STA Profile subelement shall have MAC address of the STA. Otherwise, link can not be identified after multi-link setup. | Add MAC address of the STA to each Per-STA Profile subelement. | **Revised**  Agree with the comment. And define the condition that the MAC address field in the Per-STA Profile is present.  **TGbe editor please implement changes as shown in doc 11-21/0594r0 tagged as 2489.** |

**Discussion:**

***Non-AP MLD with a single MAC Address***

Under the proposed solution for the AAD construction of the individual Management frame (as shown in the below table), the non-AP MLD is allowed to use a single MAC address. In other words, the non-AP MLD MAC address is the same as the MAC address of any affiliated STA.

The single MAC address for the non-AP MLD has the following benefits:

* For the AP MLD side, there is no need to do address conversion for the non-AP MLD
* No addressing issue, e.g.
  + It simplifies the non-AP MLD’s roaming between a legacy AP and an AP MLD [1].
  + It simplifies the TDLS addressing proposed in [2]
* Signaling overhead reduction
  + E.g. no need to advertise the affiliated STA MAC addresses for the non-AP MLD during the association and 4-way handshake [3]

In addition, the single MAC address for the non-AP MLD is a special case of the non-AP MLD with multiple MAC addresses. Hence, no big change to the current Spec. text.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MMPDU | Direction | AAD Construction | | |
| A1 | A2 | A3 |
| MLD-level MMPDU | To DS=0  From DS=1 | Non-AP MLD MAC Address | AP MLD MAC Address | AP MLD MAC Address |
| To DS=1  From DS=0 | AP MLD MAC Address | Non-AP MLD MAC Address | AP MLD MAC Address |
| Link-level MMPDU | To DS=0  From DS=1 | Non-AP MLD MAC Address | AP MLD MAC Address | Affiliated AP BSSID of target link |
| To DS=1  From DS=0 | AP MLD MAC Address | Non-AP MLD MAC Address | Affiliated AP BSSID of target link |

**Proposed spec text:**

**TGbe Editor to make the following changes in Subclause 9.4.2.295b.2:**

**9.4.2.295b.2 Basic variant Multi-Link element**

The Basic variant Multi-link element is used to carry information of an MLD and its affiliated STAs during multi-link discovery (see 35.3.4.3 (Multi-link element usage rules in the context of discovery)) and multi-link setup (see 35.3.5.4 (Usage and rules of Basic variant Multi-link element in the context of multi-link setup)).

The format of the Common Info field of the Basic variant Multi-Link element is defined in Figure 9-788eh (Common Info field of the Basic variant Multi-Link element format).

|  |  |  |  |
| --- | --- | --- | --- |
|  | MLD MAC Address | MLD Capabilities | TBD |
| Octets: | 0 or 6 | TBD | TBD |

**Figure 9-788eh—Common Info field of the Basic variant Multi-link element format**

The condition for the presence of the MLD Capabilities subfield in the Common Info field is defined in 35.3.13.4 (Capability signalling).

The Nontransparent Capable bit in the MLD Capabilities field indicates whether the nontransparent mode is supported by the non-AP MLD and is set to 1 if the nontransparent mode is supported by the non-AP MLD; otherwise set to 0. (#2297)

Other fields are TBD.

…

***TGbe editor: Please update the text after Table 9-322an as follows:***

Each Per-STA Profile subelement starts with STA Control field followed by the STA Info field and the STA Profile field as defined in 35.3.2 (Container for multi-link information).

The format of a Per-STA Profile subelement is defined in Figure 9-788xx (Per-STA Profile subelement format)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Subelement ID | | | Length | STA Control | STA Info | STA Profile |
| Octet: |  | 1 |  | 1 | TBD | variable | variable |

**Figure 9-788xx—Per-STA Profile subelement format**

The format of the STA Control field is defined in [Figure 9-788ej (STA Control field format)](#bookmark46).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 B3 | | | B4 | B5 | B8 TBD |
| Link ID | | | Complete Profile | MAC Address Present | Reserved |
| Bits: |  | 4 |  | 1 | 1 | TBD |

### Figure 9-788ej—STA Control field format

***TGbe editor: Please insert the following paragraphs after the paragraph starting: “The Complete Profile subfield is…” as follows:***

The MAC Address Present subfield indicates the presence of the STA MAC Address subfield in the STA Info field and is set to 1 if the STA MAC Address subfield is present in the STA Info field; otherwise set to 0. For a non-AP MLD, if the Nontransparent Capable bit is 0, then the MAC Address Present bit in each Per-STA Profile shall be set to 0. For an AP MLD, the MAC Address Present bit in each Per-STA Profile shall be set to 0. (#2297, 2489)

**TGbe Editor to make the following changes in Subclause 12.7.2:**

* + 1. **EAPOL-Key frames**

***Insert the following figure and paragraphs at the end of the subclause:***

The format of the MLO Link KDE is shown in Figure 12–47c

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Link Information | MAC Address | RSNE | RSNXE |
| Octets: | 1 | 6 | variable | variable |

**Figure 12–47c MLO Link KDE format**

The Link Information field contains information identifying the presence of fields in the MLO Link KDE.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B3 | B4 | B5 | B6 B7 |
|  | LinkID | MAC Address Present | RSNXEInfo | Reserved |
| bits: | 4 | 1 | 1 | 2 |

**Figure 12–47c Link Information field**

The Link ID subfield contains the link identifier for the affiliated STA link.

The MAC Address Present subfield indicates that the MAC address field is present in the MLO Link KDE when its value is set to 1. When the Nontransparent Capable bit in the (Re)Association Request frame is 0, then the MAC Address Present subfield is set to 0; when the Nontransparent Capable bit in the (Re)Association Request frame is 1, then the MAC Address Present subfield is set to 1. (#2297)

The RSNXEInfo subfield indicates that the RSNXE is present in the MLO Link KDE when its value is set to 1.

The MAC Address field contains the MAC Address of the affiliated STA for the link specified in the Link Information field when the MAC Address Present subfield is set to 1. (#2297)

The RSNE field contains the RSNE of the affiliated STA for the link specified in the Link Information field. The RSNE is described in 9.4.2.24 (RSNE).

The RSNXE field contains the RSNE of the affiliated STA for the link specified in the Link Information field. The RSNXE is described in 9.4.2.241 (RSNXE).

**TGbe Editor to make the following changes in Subclause 35.3.3:**

**35.3.3 Multi-link device addressing**

An MLD has an MLD MAC address that singly identifies the MLD.

(#1156)The MAC address of each AP affiliated with an AP MLD shall be different from each other. The AP MLD MAC address is different from the MAC address of any affiliated AP.

The non-AP MLD supports the transparent and nontransparent modes. If the transparent mode is used, the non-AP MLD MAC address is the same as the MAC address of any affiliated STA; If the nontransparent mode is used, the non-AP MLD MAC address is different from the MAC address of any affiliated STA and the MAC address of each affiliated STA shall be different from each other. (#2297)

(#2297)

…

**Do you support the resolutions for the following CIDs in doc 11-21/0594r0?**

2297, 2489

**References**

[1] 11-20-0669-04-00be-mld-transition

[2] 11-20-1692-01-00be-tdls-handling-in-mlo.pptx

[3] 11-20-0727-00-00be-mla-link-mac-addresses-security.pptx