**IEEE P802.11  
Wireless LANs**

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| LB 266 Resolution for AP removal in NSTR Mobile AP MLD | | | | |
| **Date**: August 15, 2022 | | | | |
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**Abstract**

This submission proposes resolutions for following 3 CIDs received for TGbe LB266:

14014, 14015, 13901

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Some updates to the text based on the feedback from TTT members
* Rev 2: Some online editorial changes during the meeting

***TGbe editor: The baseline for this document is 11be D2.1.1***

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. This introduction is 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 802.11 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** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 14014 | kaiying Lu | 9.4.2.312.4 | 226.39 | There is no Beacon transmitted on a non-primary link of an NSTR mobile AP MLD. Clarify the value of the Delete Timer subfield when the reported AP affiliated with an NSTR mobile AP on the non-primary link is removed. | As in comment. | **Revised**  Agree in principle; the text is updated to clarify that when the NSTR mobile AP MLD wants to remove the AP operating on the nonprimary link, the Delete Timer subfield indicates the number TBTTs corresponding to the AP operating on the primary.  **Tgbe editor: please make the changes indicated in this doc 11-22/1453r2 tagged with 14014.** |
| 14015 | kaiying Lu | 35.3.6.2.2 | 426.13 | The Delete Timer subfield indicates the number of TBTTs of the reported AP until the reported AP is removed. Clarify the value of the Delete Timer subfield when the reported AP affiliated with an NSTR mobile AP on the non-primary link is removed. | As in comment. | **Revised**  Agree in principle; the text is updated to clarify that when the NSTR mobile AP MLD wants to remove the AP operating on the nonprimary link, the Delete Timer subfield indicates the number of the TBTTs corresponding to the AP operating on the primary. Also text is added to cover the removal of the AP operating on the nonprimary link in an NSTR mobile AP MLD.  **Tgbe editor: please make the changes indicated in this doc 11-22/1453r2 tagged with 14015.** |
| 13901 | Ming Gan | 35.3.6.2.2 | 426.42 | how about mobile AP MLD, non-primary link does not send a beacon in this case | please complete the missing case of non-primary link | **Revised**  The non-AP STA are only associated with the AP operating on primary link of the NSTR mobile AP MLD, so the part of the text that the commenter is pointing out is related to disassociation of the non-AP STA which is not happening in NSTR mobile AP MLD when removing the nonprimary link (only nonprimary link can be removed). However, for removing the AP operating on the nonprimary link, the Delete Timer subfield should indicate the number of the TBTTs corresponding to the AP operating on the primary which is fixed in this doc.  **TGbe editor: please make the changes indicated in this doc 11-22/1453r2 tagged with 13901.** |

**Discussion:**

The current spec doesn’t specify the AP removal mechanism in NSTR mobile AP MLD which needs clarification. NSTR mobile AP MLD has one NSTR link pair and only the primary link is doing the beaconing and sending the probe response, so the AP operating on the nonprimary link is only allowed to be removed.

Given that in NSTR mobile AP MLD the TSF timers of all the links are the same, the Delete Timer subfield should indicate the number of TBTTs of the AP operating on primary link until the reported AP operating on the non-primary link is removed.

As only the nonprimary link can be removed and all the non-AP STAs (non-MLD EHT STAs or legacy STAs) are associated with the AP operating on the primary link, such non-AP STAs won’t be disassociated.

**9.4.2.312.4 Reconfiguration Multi-Link element**

***TGbe editor: Please insert the note after the 19th paragraphs in this subclause as shown below:***

The Delete Timer subfield indicates the number of TBTTs of the AP corresponding to the Per-STA Profile subelement until the AP is removed.

[#14014]NOTE 1—In an NSTR mobile AP MLD, the TSF timer of the AP operating on the nonprimary link is the same as the AP operating on primary link and only the AP on primary link is transmitting beacons (see 35.3.19 (NSTR mobile AP MLD operation)), so the Delete Timer subfield indicates the number of the TBTTs corresponding to the AP operating on the primary link until the AP specified in the Per-STA Profile subelement is removed.

***TGbe editor: Please update the paragraphs in 35.3.6.2.2 (Removing affiliated APs) subclause as shown below***

**35.3.6.2.2 Removing affiliated APs**

An AP MLD may remove one or more of its affiliated APs. [#14015]An AP MLD that is an NSTR mobile AP MLD shall not remove the affiliated AP operating on the primary link (see 35.3.19 (NSTR mobile AP MLD operation)). The AP MLD shall announce the removal of any affiliated AP through a Reconfiguration Multi-Link element (see 9.4.2.312.4 (Reconfiguration Multi-Link element)) in all Beacon frames [#14015]transmitted by its affiliated APs, as well as all Probe Response frames it transmits, until the affiliated AP has been removed.

For each affiliated AP that the AP MLD intends to remove, the Reconfiguration Multi-Link element shall include a Per-STA Profile subelement with the subfields of the Per-STA Control field set as following: The Link ID subfield shall identify the AP, the Complete Profile subfield shall be set to 0, the Delete Timer Present subfield shall be set to 1, and the Delete Timer subfield shall be set to the number of TBTTs of that affiliated AP before it is removed, [#14015,13901]or for NSTR mobile AP MLD the Delete Timer subfield shall be set to the number of the TBTTs of the AP operating on the primary link. The initial value of the Delete Timer subfield shall be longer than the MLD max idle period. The Per-STA Profile subelement shall not include a STA Profile field.

Additionally, [#14015]for an AP MLD which is not an NSTR mobile AP MLD, in order to terminate the BSS a to-be-removed affiliated AP belongs to (see 6.3.12 (Stop)), the SME of that affiliated AP shall perform the following,

1. It shall follow the procedure in 11.21.7.3 (BSS transition management request) to notify all associated STAs that support BTM of the BSS termination, with the BSS Transition Management Request frame fields set as follows:

—The Disassociation Imminent, BSS Termination Included, and Link Removal Imminent sub-fields of the Request Mode field are set to 1; other subfields of the Request Mode field are reserved.

—The Disassociation Timer field is set to the number of TBTTs of the affiliated AP before it transmits a Disassociation frame to the STA(s) receiving the BSS Transition Management Request frame. The Disassociation Timer field value shall point to a TBTT at or later than the TBTT pointed to by the value of the Delete Timer field of the Reconfiguration Multi-Link element in transmitted beacons.

—The BSS Termination Duration field shall be present and contain a BSS Termination Duration subelement (see 9.4.2.36 (Neighbor Report element)), with the BSS Termination TSF field of the subelement set to the value of the TSF timer when the BSS the affiliated AP belongs to will be terminated. The BSS Termination TSF field value shall indicate a time that is later than the TBTT the Disassociation Timer field value points to.

—No other optional fields shall be present in the BSS Transition Management Request frame.

2) It shall start a disassociation timer with the initial value set to the value of the Disassociation Timer field, and shall decrement the timer by one after transmitting each Beacon frame, until the timer has the value of 0. The Disassociation Timer field in all subsequent transmitted BSS Transition Management Request frames shall be set to the value of this timer.

3) Once the disassociation timer reaches a value of 0, and before the TSF indicated by the BSS Termination TSF field, it shall follow the procedure in 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure) to transmit Disassociation frames to all associated STAs that are not affiliated with a non-AP MLD. The affiliated AP shall not transmit Disassociation frames until the disassociation timer has a value of 0.

[#14015]NOTE 1— Since the non-AP STAs cannot discover or associate with the AP affiliated with NSTR mobile AP MLD operating on the nonprimary link, the NSTR mobile AP MLD does not use the BTM procedure to disassociate non-AP STAs when it is removing the AP operating on the nonprimary link

***TGbe editor: Please update the Note in 35.3.6.2.2 (Removing affiliated APs) subclause as shown below***

NOTE 2[#14015]—An AP MLD with two APs affiliated with the AP MLD might remove one of the APs affiliated with the AP MLD, and in such case, the AP MLD results in having only one AP affiliated with the AP MLD after one of the APs affiliated with the AP MLD is removed. Further, the non-AP MLD that is associated with the AP MLD with two setup links also results in having only one non-AP STA affiliated with the non-AP MLD after one of the APs affiliated with the AP MLD is removed.

**35.3.19 NSTR mobile AP MLD operation**

**35.3.19.1 General**

***TGbe editor: Please change the 1st paragraph in this subclause as shown below:***

An NSTR mobile AP MLD shall be an AP MLD which sets dot11EHTNSTRMobileAPMLDImplemented to true. If dot11EHTBaseLineFeaturesImplementedOnly is equal to true, an NSTR mobile AP MLD shall have [#14015]at most two links and shall follow with the restrictions below:

— If NSTR mobile AP MLD has two links, the links shall be part of an NSTR link pair

— The NSTR mobile AP MLD shall operate with one or two affiliated APs including the AP operating on the primary link[#14015]

— Each AP affiliated with an NSTR mobile AP MLD may optionally support the following features in

addition to the optional features supported by a regular AP

* Support of DL and UL OFDMA operation
* Support of two or more spatial streams
* Support for 160 MHz operating channel width in the 6 GHz band

— The NSTR mobile AP MLD is in a mobile device that is typically battery powered