IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB275 CR for ML Reconfiguration part 3 | | | | |
| Date: September 7, 2023 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Binita Gupta | Cisco Systems |  |  | binitag@cisco.com |
| Brian Hart | Cisco Systems |  |  | brianh@cisco.com |

Abstract

This submission proposes resolutions for following CIDs received for TGbe LB275:

19051, 20011, 19375, 20012, 19425, 19675, 19676, 19678, 20019, 20020

20022, 19680, 19682, 19932, 19935

CIDs run for r1:

19051, 20011, 19375, 20012, 19425, 19675, 19678, 19682, 19935

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Changes during the TGbe call. Changed ‘NSTR Link Pair Present’ to ‘NSTR Indication Bitmap Present’
* Rev 2: Changed 11-23/1467r0 to 11-23/1467r2 in the Resolution column.

***TGbe editor: The baseline for this document is 11be D4.0.***

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 19051 | Po-Kai Huang | 9.4.2.312.4 | 260.21 | It does not makes sense for the non-AP MLD to always indicate NSTR Bitmap Size. If the non-AP MLD is signle radio, there is no NSTR Bitmap at all. There should be a present bit to indicate if NSTR link pair is present. | The proposed text in 11-23-765-05 resolves the issue. Adopt the texts in 11-23-765-05. | Revised  Agree in principle. Text has been revised to indicate a present bit for NSTR Link Pair.  TGbe editor, please make the changes tagged by CID #19051 in 11-23/1467r2. |
| 20011 | Binita Gupta | 9.4.2.312.4 | 260.26 | For an add link operation, the NSTR Indication Bitmap subfield does not need to be included when the non-AP MLD does not have any NSTR link pair to report. Hence, need a NSTR Link Pair Present bit on indicate presence of NSTR Indication Bitmap in the STA Info field. | Add an 'NSTR Link Pair Present' bit to the STA Control field. | Revised  Same resolution as CID 19051.  TGbe editor, please make the changes tagged by CID #19051 in 11-23/1467r2. |
| 19375 | Brian Hart | 9.4.2.312.4 | 261.35 | Need more clarity here. If AP Removal Timer = 1, and this is transmitted at a TBTT or slightly later, does this mean removal happens at next TBTT so no beacon is transmitted at that next TBTT (or thereafter)? Then is AP Removal Timer == 0 reserved? | Provide more descrptive precision and consider explicitly reserving 0 as described in comment | Revised  Agreed in principle. Added text that AP Removal Timer value 0 is reserved and value 1 indicates that AP Removal occurs at the next TBTT. Added reference to clause 35.3.6.3 where AP Removal procedure is described.  TGbe editor, please make the changes tagged by CID #19375 in 11-23/1467r2. |
| 20012 | Binita Gupta | 9.4.2.312.4 | 261.34 | Clarify whether the AP Removal Timer can be set to 0 in a Reconfig ML element or if value 0 is reserved. Also, clarify the behavior when the AP Removal Timer is set to 1. | as per comment | Revised  Same resolution as CID 19375.  TGbe editor, please make the changes tagged by CID #19375 in 11-23/1467r2. |
| 19425 | Guogang Huang | 35.3.6.3 | 512.33 | The first sentence is not accurate. Please revise it as:  If there is no associated non-MLD non-AP STA or non-AP MLD with only one link which will be removed, the SME of an AP MLD shall issue the MLME-BSS-AP-REMOVAL.request primitive (see 6.5.24f.2 (MLME-BSS-AP-REMOVAL.request)) for each affiliated AP to be removed. Otherwise, the SME of an AP MLD shall issue both the MLME-BSS-AP-REMOVAL.request primitive (see 6.5.24f.2 (MLME-BSS-AP-REMOVAL.request)) and the MLME-BTM.request primitive for each affiliated AP to be removed. | As in comment. | Rejected.  Details on when BTM is sent is captured later in the clause. Current sentence is accurate as stated. No changes needed. |
| 19675 | Arik Klein | 35.3.6.3 | 513.20 | The sentence is practically meaningless since it is followed by a sentence with the requirement to set the initial value of the AP Removal Timer field to the value of the APRemovalTimer parameter of the MLME-BSS-AP-REMOVAL.request primitive. | Please move it to a note or remove it | Revised  Agree with the commenter. The should requirement for the AP Removal Timer is moved after the sentence which uses MLME parameter to set this timer.  TGbe editor, please make the changes tagged by CID #19675 in 11-23/1467r2. |
| 19676 | Arik Klein | 35.3.6.3 | 513.25 | The requirement to set the value of the AP Removal Timer applies for each of the links while the APRemovalTimer parameter of the MLME-BSS-AP-REMOVAL.request primitive refers to the TBTT of the AP to be removed. Therefore, setting the same value to each of the affiliated AP will indicate to a different point of time where the Affiliated AP is removed. Please revise the requirement as suggested. | 1. The AP Removal Timer field should point to a value indicating an absolute time (in units of TUs) rather than indicating a relative time defined in number of TBTTs (which may lead to different points in time per each link where the event of AP removal really occurs) 2. Use the same rules applied in 35.3.7.2.4 (advertised TTLM) for setting the value of Mapping Switch Timer field for the setting of the AP Removal Timer field. | Rejected  There is no issue in terms of indicating AP Removal Timer as the number of TBTT of the AP to be removed, even if the Reconfiguration ML element carries that parameter on other links. Since the timer is clearly defined w.r.t. to the AP being removed, there is no confusion when the AP removal even occurs, and it is not link dependent. The non-AP MLD determines the event of AP Removal to happen at the indicated TBTT w.r.t to the AP to be removed. Moreover, using number of TBTTs provide a much bigger range than using number of TUs. No changes needed. |
| 19678 | Arik Klein | 35.3.6.3 | 513.39 | There is no need for the condition used in the sentence, since the BTM Request frame may be transmitted only in the BSS whose affiliated AP is to be removed, regardless if the frame is individually addressed or broadcast addressed. | Please remove the following part from the sentence in P513L39 "If the BSS Transition Management Request frame(s) to notify of the termination of the BSS of an affiliated AP is individually addressed, then" and leave the remaining part of the sentence as is. | Revised  Agree with the commenter. Revised text per suggestion.  TGbe editor, please make the changes tagged by CID #19678 in 11-23/1467r2. |
| 20019 | Binita Gupta | 35.3.6.3 | 513.37 | Non-AP MLDs associated with the AP MLD learn about AP removal and corresponding BSS termination from the received Reconfig ML element. Remove the part starting from "or to notify ..." | As per comment | Revised  Agree with the commenter. Revised text per suggestion.  TGbe editor, please make the changes tagged by CID #20019 in 11-23/1467r2. |
| 20020 | Binita Gupta | 35.3.6.3 | 513.35 | An affiliated AP being removed shall transmit BTM to non-MLD non-AP STAs that support BTM to notify of BSS termination for the AP removal. Change may to 'shall' | as per comment | Revised  Agree with the commenter. Revised text per suggestion.  TGbe editor, please make the changes tagged by CID #20020 in 11-23/1467r2. |
| 20022 | Binita Gupta | 35.3.6.3 | 513.42 | For AP removal case, there may be associated non-MLD non-AP STAs which do not support BTM. AP being removed should transmit Disassociation frames to such STAs. | Capture behavior for affiliated AP to transmit Disassociation frames to associated non-MLD non-AP STAs which do not support BTM when the AP is being removed. | Revised  Agree with the commenter. Revised text per suggestion.  TGbe editor, please make the changes tagged by CID #20022 in 11-23/1467r2. |
| 19680 | Arik Klein | 35.3.6.3 | 513.54 | In case BSS Termination Included is set to 1, the BSS is terminated and the non-AP STA is disassociated, as defined in 802.11REVme D3.0 section 9.6.13.9 and in 802.11be D4.0 section 35.3.23. Hence, the Disassociation Imminent should be considered as a reserved field when the BTM Request frame is used in case of affiliated AP removal. | 1. Please revise the sentence as follows: "The BSS Termination Included, and Link Removal Imminent subfields of the Request Mode field shall be set to 1; the Preferred Candidate List Included field shall be set per 9.6.13.9 (BSS Transition Management Request frame format) if the BSS Transition Candidate List Entries field is included; other subfields of the Request Mode field are reserved." 2. Remove the paragraph in P513L60 - P513L65 regarding the setting of the Disassociation Timer field 3. Remove all the sentences that corresponds to the Disassociation Timer field. | Rejected  The non-MLD non-AP STAs are getting disassociated in the case of AP removal, hence the Disassociation Imminent bit needs to be set to 1. |
| 19682 | Arik Klein | 35.3.6.3 | 515.02 | The requirement (in P515L2) for a non-AP MLD that has a single setup link with the AP MLD and the affiliated AP operating on that link is removed to "consider that it has been disassociated from the AP MLD and shall delete the corresponding association information" is in conflict with the requirement from that affiliated AP to disassociate this non-AP MLD (see P514L58). Please resolve the conflict as suggested. | Please remove this sentence "After a non-AP MLD deletes any information maintained for the link corresponding to the removed AP, if there are no other setup links with the AP MLD, then the non-AP MLD shall consider that it has been disassociated from the AP MLD and shall delete the corresponding association information" since the AP MLD has to send a Disassociation frame to this non-AP MLD (as defined in P514L58). | Revised  There is no explicit requirement for AP MLD to send a Disassociation frame. The text has been revised to clarify.  TGbe editor, please make the changes tagged by CID #19682 in 11-23/1467r2. |
| 19932 | Rubayet Shafin | 35.3.6.3 | 512.52 | It should not be mandatory for an AP affiliated with the AP MLD to always transmit Basic ML IE, especially for the case where the AP is the only AP remaining in the AP MLD. So if, after removing the intended AP, there is only 1 AP remaining in the AP MLD, then during the advertisement of the AP removal using the Reconfiguration ML IE, the AP MLD may no longer include Basic ML IE in the management frame. In this case, the Reconfiguration ML IE would need an MLD MAC Address. | Revise the paragraph to address the scenario depicted in the comment. | Rejected  An affiliated AP of an AP MLD always includes a Basic ML element per requirements text in 35.3.4.4. No changes needed. |
| 19935 | Rubayet Shafin | 35.3.6.3 | 515.30 | This paragraph is written in a way that indicates that the link is removed first using ML reconfig and then the link is removed from the EMLSR/EMLMR links. It should be the other way around. | as in comment. | Revised  Revised text slightly to not imply a sequence.  TGbe editor, please make the changes tagged by CID #19935 in 11-23/1467r2. |

**9.4.2.312.4 Reconfiguration Multi-Link element**

***TGbe editor: Please update the following Figure and paragraphs in this subclause as shown below (19051):***

The format of the STA Control field is defined in [Figure 9-1001x (STA Control field format for the Recon-](#_bookmark215) [figuration Multi-Link element(#15985))](#_bookmark215).

B0 B3 B4 B5 B6 B7 B10 B11 B12 B13 B14 B15

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Link ID | Complete Profile | STA MAC  Address Present | AP  Removal Timer Present | Operation Update Type | Operation Parameters Present | NSTR  Bitmap Size | NSTR  Indication Bitmap Present | Reserved |

Bits: 4 1 1 1 4 1 1 1 2

**Figure 9-1001x—STA Control field format for the Reconfiguration Multi-Link element**

…

The NSTR Indication Bitmap Present subfield in the STA Control field is set to 1 if at least one NSTR link pair is present for the non-AP MLD that contains the link corresponding to the Link ID, otherwise this subfield is set to 0.

If the NSTR Indication Bitmap Present subfield is equal to 1 in the STA Control field, then the STA Info field contains an NSTR Indication Bitmap subfield whose size is indicated in the NSTR Bitmap Size subfield; otherwise, the NSTR Indication Bitmap subfield is not present in the STA Info field. (#15985)The NSTR Bitmap Size subfield indicates the size of the NSTR Indication Bitmap subfield (if present) in the STA Info field and is set to 1 if the length of the corresponding NSTR Indication Bitmap subfield is equal to 2 octets and is set to 0 if the length of the corresponding NSTR Indication Bitmap subfield is equal to 1 octet. The NSTR Bitmap Size subfield in the STA Control field is reserved if the NSTR Indication Bitmap Present subfield is equal to 0.

***TGbe editor: Please update the following Figure and paragraphs in this subclause as shown below (19051):***

***﻿***The AP Removal Timer subfield indicates the number of TBTTs of the AP corresponding to the Per-STA Profile subelement until the AP is removed. (#19375) Value 1 for this subfield indicates that the AP removal occurs at the next TBTT, Value 0 is reserved for this subfield. At the TBTT indicated by the AP Removal Timer subfield, the AP MLD follows the procedures defined in clause 35.3.6.3 (Removing affiliated APs) to remove the affiliated AP.

**35.3.6.4 ML reconfiguration to the ML setup**

***TGbe editor: Please update the following paragraphs in this subclause as shown below(19051):***

The following rules apply for each Per-STA Profile subelement corresponding to a non-AP STA which is contained in the Reconfiguration Multi-Link element included in the Link Reconfiguration Request frame:

* If the non-AP MLD is indicating to add a link, it shall set the fields in the Per-STA Profile subelement as follows:
  + The Link ID subfield shall be set to the link identifier of the AP affiliated with the associated AP MLD that is operating on the link that the non-AP MLD is requesting to add. The Complete Pro- file subfield and the STA MAC Address Present subfield shall be set to 1. The AP Removal Timer Present subfield shall be set to 0. The Operation Update Type subfield shall be set to 2. The Operation Parameters Present subfield shall be set to 0.
  + The NSTR Indication Bitmap Present bit shall be set to 1 if at least one NSTR link pair is present for the non-AP MLD that contains the link corresponding to the Link ID, otherwise this bit shall be set to 0. If the NSTR Indication Bitmap Present bit is set to 1, the NSTR Bitmap Size subfield shall be set to indicate the size of the NSTR Indication Bitmap subfield.
  + The STA MAC Address subfield in the STA Info field shall be set to the STA MAC address of the non-AP STA that is indicated for operation on the link requested to be added with the AP indicated by the link ID.
  + If the NSTR Indication Bitmap Present bit is set to 1, the NSTR Indication Bitmap subfield in the STA Info field shall be included and shall be set to indicate STR or NSTR for each pair of links formed between the link corresponding to the Link ID and other setup links for the non-AP MLD by setting the corresponding bit in the NSTR Indi- cation Bitmap subfield to 0 or 1.
  + The STA Profile field shall include the complete profile for the corresponding non-AP STA identified by the STA MAC Address and shall consist of all the elements and fields that would be included in the STA Profile field for that non-AP STA in a Reassociation Request frame sent on the current link that includes the corresponding non-AP STA as a reported STA as per procedures in [35.3.3.3 (Advertisement of complete or partial per-link information)](file:///C:\Users\binit\AppData\Local\Temp\Temp2_Draft%20P802.11be_D3.2%20-%20Word.zip\Draft%20P802.11be_D3.2%20-%20Word\TGbe_Cl_35.docx#_bookmark14), except no inheritance is applied and all the applicable elements and fields are included in the STA Profile field itself.
* If the non-AP MLD is indicating to delete an existing link, it shall set the fields in the Per-STA Profile subelement as follows:
  + The Link ID subfield shall be set to the link identifier of the AP affiliated with the AP MLD that is operating on the link that is requested to be deleted from the ML setup. The Complete Profile subfield shall be set to 0. The STA MAC Address Present subfield shall be set to 1. The AP Removal Timer Present subfield shall be set to 0. The Operation Update Type subfield shall be set to 3. The Operation Parameters Present subfield shall be set to 0. The NSTR Indication Bitmap Present bit shall be set to 0.
  + The STA MAC Address subfield in the STA Info field shall be set to the STA MAC address of the non-AP STA operating on the link indicated by the link ID, which is requested to be deleted.
  + The NSTR Indication Bitmap subfield shall not be included.
  + The STA Profile field shall not be included.

**﻿**

﻿**35.3.6.3 Removing affiliated APs**

***TGbe editor: Please modify 6th paragraph in this subclause as shown below.***

In the Reconfiguration Multi-Link element, the EML Capabilities Present subfield and the MLD Capabilities And Operations Present subfield shall be set to 0. 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 STA Control field and the STA Info field set as following:

* The Link ID subfield shall be set to the link identifier of the AP being removed.
* The Complete Profile subfield shall be set to 0 and the STA MAC Address Present subfield shall be set to 0.
* The AP Removal Timer Present subfield shall be set to 1 and the Reconfiguration Operation Type subfield shall be set to 1. The Operation Parameters Present bit shall be set to 0.
* The AP Removal Timer subfield in the STA Info field shall be set to the number of TBTTs of the affiliated AP before it is removed or for the NSTR mobile AP MLD the AP Removal Timer subfield shall be set to the number of the TBTTs of the AP operating on the primary link before the affiliated AP operating on the nonprimary link is removed. (#19675)The initial value of the AP Removal Timer subfield shall be set to the value of the APRemovalTimer parameter of the MLME-BSS-AP-REMOVAL.request primitive and the AP Removal Timer value shall be decremented by 1 in each subsequent Beacon frame. specified by the APRemovalTimer parameter
* No other subfields shall be included in the STA Info field.

***TGbe editor: Please modify 8th paragraph in this subclause as shown below.***

﻿An affiliated AP that is being removed (#20020)shall transmit BSS Transition Management Request frame(s) to notify of the termination of its BSS to associated non-MLD non-AP STAs that support BTM. (#20019)(19678)The BSS Transition Management Request frame(s) shall not be transmitted by other affiliated APs of the AP MLD.

***TGbe editor: Please add following paragraph in this subclause just after NOTE 3 (P514L25).***

(#20022)An affiliated AP that is being removed should transmit a Disassociation frame to associated non-MLD non-AP STAs that do not support BTM after the affiliated AP is removed (i.e. after the AP Removal Timer has expired) from the AP MLD.

***TGbe editor: Please modify paragraph on P514L59 in this subclause as shown below.***

﻿At the TBTT indicated by the value of the AP Removal Timer subfield in transmitted Reconfiguration Multi-Link elements, the AP MLD shall (#19682)consider a non-AP MLD as disassociated if the link corresponding to the removed AP is the only setup link between the AP MLD and the non-AP MLD.

***TGbe editor: Please modify paragraph on P515L30 in this subclause as shown below.***

﻿If an AP affiliated with an AP MLD is removed and if the link associated with the removed AP is one of the EMLSR links or the EMLMR links for one or more non-AP MLDs, (#19935)the AP MLD shall remove the corresponding link from the EMLSR links and/or EMLMR links (as applicable) of those non-AP MLDs.