IEEE P802.11
Wireless LANs

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| LB271 CR for Clause 35.3.7.4.2 – Part 1 |
| Date: 2023-04-04 |
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Abstract

This submission proposes CR for 10 CIDs: 15601, 16017, 16018, 16019, 16020, 16510, 18152, 18153, 18154, 18249 (LB271) regarding clause 35.3.7.4.2 - Affiliated AP link disablement

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Adding green tags (Alfred) + several offline comments
* Rev 2: more offline editorial comments + several deferred CIDs during discussion
* Rev 3: resolving deferred CIDs: 18154, 18249, 16510, 16020
* Rev 4: more offline comments by Brian (also highlighted) + modify resolution of CID 16018
* Rev 5: more offline comments by Laurent (also highlighted)

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** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
| 16017 | Binita Gupta | 523.14 | 35.3.7.4.2 | The link disablement operation is at the MLD level and the advertised T2L mapping need to be advertised by all the affiliated APs of the MLD. | Modify text to indicate that the MLME-BSS-LINK-DISABLE.request primitive is received by the AP MLD and the advertised T2L mapping is sent by all affiliated APs of the AP MLD, not just by the AP which is being disabled. | **Revised**Agree with the commenter. The modified text includes the advertisement of the TID-To-Link Mapping element by each of the APs affiliated with the AP MLD. The disabled link is defined as the link on which the AP corresponding to the BSSID parameters indicated in the MLME-BSS-LINK-DISABLE.request primitive is operating.**TGbe editor please implement changes as shown in doc 11-23/0593r2 tagged as 16017.** |
| 16018 | Binita Gupta | 523.24 | 35.3.7.4.2 | Non-AP MLDs learn about link disablement through advertised T2L mapping. The BTM is not needed by non-AP MLDs and is only needed if there are associated non-AP STAs not affiliated with an MLD. Clarify this in the text. | Modify to "Additionally, if there are associated non-AP STAs that are not affiliated with a non-AP MLD and support BTM, the SME of the affiliated AP for the link being disabled shall perform the following to notify of link disablement to such STAs:"Also modify first bullet "...to notify all associated non-AP STAs which are not affiliated with a non-AP MLD and support BTM,..." | **Revised**Agree in principle with the comment.The paragraph is modified for the case that there are associated non-MLD non-AP STAs that support BTM. It is also indicated that all the operations are performed by the affiliated AP that is operating on the link advertised as to become disabled**TGbe editor please implement changes as shown in doc 11-23/0593r5 tagged as 16018.** |
| 15601 | Bo Sun | 523.28 | 35.3.7.4.2 | the description of "all associated STAs " is not clear, change it to "all associated STAs that are not affiliated with a non-AP MLD" | as in comment | **Revised**Agree in principle with the comment.The paragraph is modified for the case that there are associated non-MLD non-AP STAs that support BTM. It is also indicated that all the operations are performed by the affiliated AP that is operating on the link advertised as disabled**TGbe editor please implement changes as shown in doc 11-23/0593r2 tagged as 16018.** |
| 18152 | Abhishek Patil | 523.28 | 35.3.7.4.2 | The BTM procedure applies to "non-MLO" STAs. | Add 'non-MLO' before 'STAs' (also applies to L35) | **Revised**Agree in principle with the comment.The paragraph is modified for the case that there are associated non-MLD non-AP STAs that support BTM. It is also indicated that all the operations are performed by the affiliated AP that is operating on the link advertised as disabled**TGbe editor please implement changes as shown in doc 11-23/0593r2 tagged as 16018.** |
| 18249 | Li-Hsiang Sun | 523.31 | 35.3.7.4.2 | Link removal Immiment has no meaning when BSS Termination Included =0 | remove "and Link Removal Imminent" | **Revised**In case of non-MLD non-AP STA, when a link is disabled by an affiliated AP, the BSS on which it is operating is terminated. Thus, the text is revised so that BSS Termination Included subfield shall be set to 1 (and the Link Removal Imminent subfield is already ignored by the non-MLD non-AP STA).**TGbe editor please implement changes as shown in doc 11-23/0593r5 tagged as 18249.** |
| 18153 | Abhishek Patil | 523.35 | 35.3.7.4.2 | There may be more than one non-MLO STA associated with the AP whose link is being disabled. In such case, the AP would need to transmit more than one Disassociation frame. Therefore, replace 'a Disassociation frame' to 'Disassociation frame(s)' | As in comment | **Accepted** |
| 18154 | Abhishek Patil | 523.40 | 35.3.7.4.2 | AP should include NR IE to provide candidate APs. | Add a bullet before this as follows: "The BSS Transition Candidate List Entries field may be included specifying one or more Neighbor Report elements to provide BSS transition candidate list." | **Revised**Agree with the comment. The text is revised as follows:” The BSS Transition Candidate List Entries field may be included which contains one or more Neighbor Report elements in order to provide a BSS transition candidate list”**TGbe editor please implement changes as shown in doc 11-23/0593r5 tagged as 18154.** |
| 16019 | Binita Gupta | 523.47 | 35.3.7.4.2 | The Disassociation frame transmitted for link disablement shall only be sent to STAs that are not affiliated with a non-AP MLD and shall not be sent to STAs affiliated with non-AP MLDs. Clarify this is the text. | Modify 3rd bullet to "Once the disassociation timer reaches a value of 0, it shall follow the procedure in 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure) to transmit Disassociation frames to only those 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." | **Revised**Agree in principle with the commenter. The text is revised as follows:” Once the value of the disassociation timer is equal to 0, it should follow the procedure in 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure) to transmit Disassociation frames to all associated (#16018) non-MLD non-AP STAs (i.e. that are not affiliated with a non-AP MLD).”**TGbe editor please implement changes as shown in doc 11-23/0593r2 tagged as 16018.** |
| 16510 | Arik Klein | 523.55 | 35.3.7.4.2 | Revise the following sentence for clarity, as suggested: "the Disabled Link Indication subfield shall be set to 1 in the MLD Parameters subfield corresponding to the AP affiliated with the AP MLD and operating on the link thati s included in the Neighbor AP Information field in the Reduced Neighbor Report element carried in the Beacon or Probe Response frames transmitted by any of the APs affiliated with the AP MLD and any APs that set the CoLocated AP bit of the BSS Parameters subfield of the TBTT Information field of the Neighbor AP Information field to 1 for the disabled AP." | The sentence should be revised as follows: "the Disabled Link Indication subfield shall be set to 1 in the MLD Parameters subfield \*contained in the TBTT Information field of the Reduced Neighbor Report element carried in the Beacon or Probe Response frames transmitted by any of the APs affiliated with the AP MLD\* and corresponding to the AP affiliated with the AP MLD \*that is\* operating on the \*disabled\* link and any APs that set the CoLocated AP \*subfield in\* the BSS Parameters subfield \*included in\* the TBTT Information field of the Neighbor AP Information field to 1 for the \*affiliated\* AP \*operating on the disabled link\*." | **Revised**Agree with the comment. The sentence is revised as suggested and divided into several sub-sentences for clarity.**TGbe editor please implement changes as shown in doc 11-23/0593r5 tagged as 16510.** |
| 16020 | Binita Gupta | 523.55 | 35.3.7.4.2 | First part of the paragraph is hard to follow. Suggest to break into multiple sentences or simplify. | As in comment | **Revised**Agree with the comment. The sentence is revised as suggested and divided into several sub-sentences for clarity.**TGbe editor please implement changes as shown in doc 11-23/0593r5 tagged as 16510.** |

*TGbe editor: Please note baseline is 11be D3.1 and REVme D**2.1*

###### Affiliated AP link disablement

***TGbe editor: Please update the following subclause as follows:***

(#16017)Upon receiving an MLME-BSS-LINK-DISABLE.request primitive, each of the APs affiliated with an AP MLD shall advertise a TID- to-link mapping, in transmitted Beacon and Probe Response frames, that does not map any TIDs to the link on which the AP, that corresponds to the BSSID parameter indicated in that primitive, is operating. The Mapping Switch Time field for the advertised TID-to-link mapping shall point to the same time as indicated in the DisableTimer parameter of the MLME-BSS-LINK- DISABLE.request primitive. The Expected Duration field of the advertised TID-to-link mapping shall indicate the same duration as the ExpectedDuration parameter of the MLME-BSS-LINK-DISABLE.request primitive.

(#16018) Additionally, if there are associated non-MLD non-AP STAs that support BTM, the SME of the affiliated AP, that is operating on the link advertised as to become disabled, shall perform the following, in order to indicate the imminent termination of the BSS of these non-AP STAs:

1. The affiliated AP shall follow the procedure in 11.21.7.3 (BSS transition management request) (#16018) with the BSS Transition Management Request frame fields set as follows:
	* (#18249) The Disassociation Imminent and BSS Termination Included subfields of the Request Mode field are set to 1, , and 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 (#18153) Disassociation frame(s) 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 time pointed to by the value of the Mapping Switch Time field for the advertised TID-to-link map- ping.
	* (#18154) The BSS Transition Candidate List Entries field may be included which contains one or more Neighbor Report elements in order to provide a BSS transition candidate list.
	* No other optional fields shall be present in the BSS Transition Management Request frame.
2. The affiliated AP 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 is 0, the affiliated AP should follow the procedure in 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure) to transmit Disassociation frames to all associated (#16018) non-MLD non-AP STAs (i.e. that are not affiliated with a non-AP MLD). The affiliated AP shall not transmit Disassociation frames until the disassociation timer is 0.

When an AP MLD advertises that a link is disabled for all associated non-AP MLDs, after the time indicated by the Mapping Switch Time field is reached:

* (#16510) the Disabled Link Indication subfield shall be set to 1 in the MLD Parameters subfieldthat (#15118)is included in the TBTT Information field corresponding to the AP affiliated with the AP MLD where the affiliated AP is operates on the link that is being disabled and the TBTT Information field is contained in the Reduced Neighbor Report element carried in the Beacon or Probe Response frames transmitted by:
	+ any of the APs affiliated with the same AP MLD as the AP that operates on the link that is being disabled and
	+ any APs that have set the Co-Located AP subfield of the BSS Parameters subfield of the TBTT Information field to 1 for the affiliated AP that operates on the link that is being disabled.

If the Disabled (#15119)Link Indication subfield corresponding to a reported AP is set to 1, then the Neighbor AP TBTT Offset subfield included in the same TBTT Information field of the Reduced Neighbor Report element shall be set to 255.

* (#16348)a non-AP EHT STA affiliated with a non-AP MLD that is associated with the AP MLD shall not use the link to transmit individually addressed frames to the AP affiliated with the AP MLD that is operating on a link that is disabled.
* (#16348)a non-AP EHT STA affiliated with a non-AP MLD that is not associated with the AP MLD shall not transmit ML Probe Request, Authentication, and (Re)association Request frames to the AP affiliated with the AP MLD while the link is disabled (as indicated in the Expected Duration field in the advertised TID-To-Link Mapping element that does not include Mapping Switch time field, or as indicated in the Disabled Link Indication subfield in the Reduced Neighbor Report element).
* (#16348)a non-AP EHT STA affiliated with a non-AP MLD that is not associated with the AP MLD should not use the link to transmit other individually addressed management frames to the AP affiliated with the AP MLD that is operating on a link that is disabled.
* a non-AP STA affiliated with the non-AP MLD shall not delete the GTK/IGTK/BIGTK values for the disabled link.

NOTE 1—When an AP MLD advertises that a link is disabled for all associated non-AP MLDs, a non-AP MLD remains associated with the AP MLD.

NOTE 2—The AP affiliated with an AP MLD that is operating on the link to become disabled may disassociate or use BTM in advance for non-AP STAs not (#15120)affiliated with an MLD.

NOTE 3—The non-AP MLD uses the GTK/IGTK/BIGTK for the reception of protected broadcast/groupcast management frames when the link becomes enabled again.

An AP affiliated with an AP MLD that intends to turn its operating link into a disabled link should verify that it is not associated with any non-MLD non-AP STA on that link (i.e. the link to become disabled).

Straw Poll:

Do you support to incorporate the proposed draft text in this document 11-23/0593r5 to the next revision of TGbe Draft 3.1, for addressing the following CIDs: 15601, 16017, 16018, 16019, 16020, 16510, 18152, 18153, 18154, 18249 (LB271)?

Result: Yes/No/Abstain