IEEE P802.11
Wireless LANs

|  |
| --- |
| SA ballot: CR for 35.3.7.5 |
| Date: 2024-20-02 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Arik Klein | Huawei | Huawei TLV Research Center |  | arik.klein@huawei.com  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes CR for 7 CIDs: 22056, 22057, 22058, 22278, 22282, 22283, 22414

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: adding CID 22414 (per Edward’s request), modified text, based on offline discussions.

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** |
| --- | --- | --- | --- | --- | --- | --- |
| 22058 | Michael Montemurro | 539.08 | 35.3.7.5.2 | [AK] The exception in NOTE 1 should be extended to the general case where are the setup links between the non-AP MLD and the AP MLD are advertised as disabled. Please revise the sentence as suggested. | Please revise the note as follows:" 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 unless the non-AP MLD has one or more setup links with the AP MLD and all these links are advertised as disabled." | **Accepted** |
| 22057 | Michael Montemurro | 539.18 | 35.3.7.5.2 | [AK] The paragraph that discusses the transmission of Disassociation frame to non-MLD non-AP STAs that do not support BSS transition capability (P539L18-L23) should be moved after the paragraph that discusses the transmission of the Disassociation frame to non-MLD non-AP STAs that support BSS transition capability (P537L56 - P538L30) | As in comment | **Accepted** |
| 22282 | Tomoko Adachi | 539.20 | 35.3.7.5.2 | Subclause, 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure) is referred. But 11.3.6.8 is about the behavior at the AP MLD when it receives an MLME-DISASSOCIATE.request primitive. From 6.5.9.1.3, the MLME-DISASSOCIATE.request is used for an MLD to disassociate from an MLD. The reference should be corrected to the case when the AP MLD receives MLME-BSS-LINK-DISBLEMENT.request. Receipt of this primitive may result in transmitting Disassociation frames, but it is independent with the MLME-DISASSOCIATE.request primitive. And the link disablement at the AP MLD is described in this subclause, 35.3.7.5.2, not in 11.3.6.8. So, one way to correct this is to refer to 6.5.24a.2, i.e., change "(see 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure))" to "(see 6.5.24a.2 (MLME-BSS-LINK-DISABLE.request))". Another way is to delete "(see 11.3.6.8 (AP, AP MLD, or PCP disassociation initiation procedure))". Yet another way may be to correct 11.3.6.8 to describe also the case when the AP MLD receives the MLME-BSS-LINK-DISABLE.request primitive(, but as this primitive only applies to an AP MLD, I believe the description should be in 35.3.7.5.2, not in 11.3.6.8). | As in comment. | **Revised**Agree with the comment that the procedure described in 11.3.5.8 is initiated when the SME issues an MLME-DISASSOCIATE.request primitive. The items a-f in 11.3.5.8 have been moved to a new subclause 11.3.5.8.1 and the reference is modified to subclause 11.3.5.8.1.**TGbe editor please implement changes as shown in doc 11-24/0294r1 tagged as 22282.** |
| 22414 | Chaoming Luo | 539.37 | 35.3.7.5.2 | A better wording is needed. The sentence may mislead to mean "a link that is not disabled, or a link that is due to be disabled" | change "a link that is not disabled or due to be disabled" to "a link that is not disabled or not due to be disabled" | **Accept** |
| 22278 | Tomoko Adachi | 539.41 | 35.3.7.5.3 | How to add an enabled link is not described at the beginning of 35.3.7.5.3, as it only describes to stop advertising when no TIDs are mapped to the link. And when the default mapping is applied, the MLME-BSS-LINK-ENABLE.request should not be received, because the default mapping consists of only the setup links which are all enabled and there is no link that can be changed from disabled to enabled. When a link needs to be added under the default mapping, the MLME-START.request should be used. | At the beginning of this subclause, first clarify how to enable links when nondefault mapping is applied (triggered by receiving the MLME-BSS-LINK-ENABLE.request primitive). Also, add a note to describe that in a case when default mapping is applied and a link needs to be added, the MLME-BSS-LINK-ENABLE.request is not used, and instead, the MLME-START.request is used as described in 35.3.6.2 (Adding affiliated APs). | **Rejected**The commenter has failed to indicate a technical issue in the specified text.Adding a link to an AP MLD is defined in 35.3.6.2. The 35.3.7.5.3 clause deals with enabling a link on which an AP affiliated with AP MLD is operating after this link was disabled. Obviously, this case is applicable only when non-default TTLM is used.In addition, NOTE2 clarifies that after the enablement of the link is applied, if no TTLM is advertised – it means that the default mapping is currently applied. |
| 22056 | Michael Montemurro | 540.22 | 35.3.7.5.3 | [AK] The case mentioned in NOTE 2 is already defined in 35.3.7.2.4 . Please refer the reader to that section for the full details of normative behavior, as suggested | Please revise the language in NOTE 2, as follows:" After the enablement of an AP link is established, if there is no TTLM advertised, the associated non-AP MLD with affiliated non-AP STA operating on that link follow the rules defined in 35.3.7.2.4 (Advertised TTLM in Beacon and Probe Response frames) | **Accepted** |
| 22283 | Tomoko Adachi | 0.00 | 35.3.7.5.2 | It is not clear how the link disablement at the AP MLD gives impact to non-MLD non-AP STAs. The fact is, such non-MLD non-AP STAs will loose connection. Note that, in 6.5.24a.1, there is a sentence "An affiliated AP, while operating on a disabled link, does not transmit or receive any frames.", and in 6.5.24a.2.2, there is a primitive parameter, DisassociateNonMLDSTAs, which is used to choose whether to diassociate all the associated STAs not affiliated with an MLD in an infrastructure BSS before the occurence of the disablement or not. So, the disassociation of all associated STAs not affiliated with an MLD may not occur due to the primitive parameter in 6.5.24a.2.2, while the affiliated AP link disablement results in link loss for the associated STAs not affiliated with an MLD by the sentence in 6.5.24a.1. | Add "When an AP MLD advertises a link to be disabled, while there are non-MLD non-AP STA associated with the affiliated AP operating on that link, the association of the non-MLD non-AP STA will be terminated when the link is disabled." as a single paragraph before the 6th paragraph, which starts with "An AP affiliated with an AP MLD that intends to turn its operatling link into a disablement link should, ...". | **Revised**Agree with the comment that the DisassociateNonMLDSTAs parameter should be removed from the MLME-BSS-LINK-DISABLE.request primitive.**TGbe editor please implement changes as shown in doc 11-24/0294r1 tagged as 22283.** |

*TGbe editor: Please note baseline is 11be D5.0 and REVme D**5.0*

* AP or PCP disassociation initiation procedure

The SME shall issue an MLME-DISASSOCIATE.request primitive that includes an appropriate Reason Code as defined Table 9-79 (Reason codes) of 9.4.1.7 (Reason Code field).

Upon receipt of an MLME-DISASSOCIATE.request primitive, an AP or PCP shall disassociate a STA using the following procedure (#22282) detailed in subclause 11.3.5.8.1.

#### 11.3.5.8.1 AP or PCP disassociation initiation detailed procedure

* If the state for the STA is State 3 or State 4, the AP or PCP shall generate a Disassociation frame to be transmitted to the indicated STA.

NOTE—As the Disassociation frame is a bufferable MMPDU, the transmission of this frame might be delayed by the operation of a power saving protocol. The AID and the PTKSA are maintained (when applicable) until the frame is acknowledged or attempts to transmit the frame are abandoned.

* The state for the STA shall be set to State 2, if it was not State 1 (11az)or State 1a. The MM-SME shall perform this process for each STA whose address was included in the MMS parameter of the MLME-ASSOCIATE.request or MLME-REASSOCIATE.request primitive that established the association.
* Once the Disassociation frame is acknowledged or attempts to transmit the frame are abandoned, the MLME shall issue an MLME-DISASSOCIATE.confirm primitive to inform the SME of the disassociation.
* Upon receiving an MLME-DISASSOCIATE.confirm primitive, the SME shall delete any PTKSA, GTKSA, IGTKSA, BIGTKSA(11ba), (#3344)WIGTKSA, WTKSA, and TPKSA (including temporal keys)(#205) held for communication with the STA by using the MLME‑DELETEKEYS.request primitive (see 12.6.16 (RSNA security association termination)) and by invoking an MLME-SETPROTECTION.request(None) primitive. The MM-SME shall perform this process for each STA whose address was included in the MMS parameter of the MLME-ASSOCIATE.request or MLME-REASSOCIATE.request primitive that established the association.
* Upon receiving an MLME-DISASSOCIATE.confirm primitive, the SME shall release the AID assigned for the indicated STA, if the state for the indicated STA was State 3 or State 4.
* AP only: The SME shall inform the DS of the disassociation.

#### 35.3.7.5 Affiliated AP link disablement and enablement

#### Affiliated AP link disablement

***TGbe editor – please update the 4th subclause, as follows:***

Additionally, if there are associated non-MLD non-AP STAs that support BSS transition capability, 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) with the BSS Transition Management Request frame fields set as follows:
	* The Disassociation Imminent and Link Removal Imminent fields of the Request Mode field are set to 1, the BSS Termination Included field is set to 0, the Preferred Candidate List Included

field is set according to 9.6.13.9 (BSS Transition Management Request frame format) if the BSS Transition Candidate List Entries field is included, and other fields of the Request Mode field are set to 0.

* + The Disassociation Timer field is set to the number of TBTTs of the affiliated AP before it transmits Disassociation frame(s) to the non-MLD non-AP 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 TTLM.
	+ The BSS Termination Duration field shall be present and shall contain a BSS Termination Duration subelement (see 9.4.2.35 (Neighbor Report element)), with the BSS Termination TSF field set to the same time pointed by the Mapping Switch Time field value of the advertised TTLM element and the Duration field of the subelement set to the approximate value indicated by the Expected Duration field of the advertised TTLM element.
	+ The BSS Transition Candidate List Entries field, which contains one or more Neighbor Report elements, may be included to provide a BSS transition candidate list.
	+ No other optional fields shall be present in the BSS Transition Management Request frame.
1. 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.
2. (#22282) Once the disassociation timer is 0, the affiliated AP should follow the procedure described in 11.3.5.8.1 (AP, AP MLD, or PCP disassociation initiation detailed procedure) to disassociate all associated non-MLD non-AP STAs (i.e., that are not affiliated with a non-AP MLD) and operating on the link to be disabled. The affiliated AP shall not transmit Disassociation frames until the disassociation timer is 0.

(#22057) (#22282) follow the procedure descried in5.1 detailed disassociate all associated non-MLD non-AP STAs that do not support BSS transition capability and operating on the link to be disabled.

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:

* the Disabled Link Indication subfield shall be set to 1 in the MLD Parameters subfield of the TBTT Information field corresponding to the AP affiliated with the AP MLD where the affiliated AP operates on the link that is being disabled and 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 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.

* a non-AP 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.
* a non-AP STA affiliated with a non-AP MLD that is not associated with the AP MLD shall not transmit multi-link 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).
* a non-AP 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.
* If not all the setup links of an non-AP MLD are disabled (as advertised by the AP MLD), a non-AP STA affiliated with the non-AP MLD shall not delete the GTK/IGTK/BIGTK values corresponding to the affiliated AP operating on the link that will be disabled.
* The AP affiliated with an AP MLD that is operating on that link shall not transmit any frame to any of the non-AP STAs affiliated with its associated non-AP MLD (see [35.3.7.2.1 (General)](#_bookmark38)).

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 unless the non-AP MLD has (#22058) one or more setup links with the AP MLD and all these links are advertised as disabled.

NOTE 2—The AP affiliated with an AP MLD that is operating on the link that will be disabled might disassociate or use a BSS Transition Management Request frame for non-AP STAs not affiliated with an MLD.

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

(#22057)

When an AP MLD has advertised one or more links to be disabled using an advertised TTLM transmitted in Beacon and Probe Response frames, and the time indicated by the Mapping Switch Time field has reached, the MLME of a non-AP MLD that has all the setup links with the AP MLD operating on disabled links, shall issue an MLME-DISASSOCIATE.indication primitive to inform the SME for the disassociation of the non- AP MLD. The MLME-DISASSOCIATE.indication reason code should be set to any value except configuration or parameter mismatch, to follow the procedure defined in 11.3.6.7 (Non-AP STA, non-AP MLD, and non-PCP STA disassociation receipt procedure).

NOTE 4—If a non-AP MLD has one or more setup links with the AP MLD and the AP MLD advertises the upcoming disablement of these one or more links, the non-AP MLD can maintain association with the AP MLD by performing an ML reconfiguration operation (see [35.3.6.4 (Link reconfiguration to the ML setup)](#_bookmark32)) to switch its link with the AP MLD to a link that is not disabled or (#22414) not due to be disabled.

####  Affiliated AP link enablement

***TGbe editor – please update NOTE 2, as follows:***

NOTE 2—After the enablement of an AP link is established, if there is no TTLM advertised, (#22056) the associated non-AP MLD with affiliated non-AP STA operating on that link follow the rules defined in 35.3.7.2.4 (Advertised TTLM in Beacon and Probe Response frames).

**6.5.24a.2 MLME-BSS-LINK-DISABLE.request**

**6.5.24a.2.1 Function**

This primitive requests the AP MLD to temporarily cease the operation of the BSS corresponding to the affiliated AP operating on a link.

**6.5.24a.2.2 Semantics of the service primitive**

The primitive parameters are as follows: MLME-BSS-LINK-DISABLE.request(

BSSID,

DisableTimer, ExpectedDuration, (#22283)

)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| BSSID | MAC address | Any valid individual address | The BSSSID of the AP operating on the link to be disabled. |
| DisableTimer | Integer | 0–65 535 | Specifies the number of TUs until the link on which the AP is operating becomes dis- abled. |
| ExpectedDuration | Integer | 0–16 777 215 | Indicates the expected duration in TUs for which the requested disablement is expected to be effective. |
| (#22283) |  |  |  |

**6.5.24a.2.3 When generated**

This primitive is generated by the SME when it decides to disable a link on which an affiliated AP is operating.

**6.5.24a.2.4 Effect of receipt**

The primitive starts the affiliated AP link disablement process in 35.3.7.5.2 (Affiliated AP link disablement). All services provided by the AP to an infrastructure BSS, including Beacon and Probe Response frame transmissions and access to the DS, are stopped during the disablement. All associated non-AP MLDs in the BSS will be signaled that no TIDs map to the link on which the AP is operating. (#22283).

Straw Poll:

Do you support to incorporate the proposed draft text in this document 11-24/0294r1 to the next revision of TGbe Draft 5.0, for addressing the following CIDs: 22056, 22057, 22058, 22278, 22282, 22283, 22414?

Result: Yes/No/Abstain