IEEE P802.11
Wireless LANs

|  |
| --- |
| Resolution for CIDs assigned to Abhi – part 4 |
| Date: April 17, 2023 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Gaurang Naik |  |  |  |
| George Cherian |  |  |  |
| Alfred Asterjadhi |  |  |  |
| Duncan Ho |  |  |  |
| Yanjun Sun |  |  |  |
| Abdel Karim |  |  |  |

 Abstract

This submission proposes resolutions for following 10 CIDs received for TGbe LB271:

18189 16081 16755 16236 16237 16756 18269 15009 16758 18270

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Green tagged and minor updates to resolution column based on suggestion from chair (while green tagging).
* Rev 2: Updated the resolution for CID 16237 to update a NOTE in baseline spec (NOTE 5 in clause 9.4.2.45 (Multiple BSSID set))
* Rev 3: fixed a typo in the resolution column for CID 16237
* Rev 4: Further updates to the NOTE 5 in the resolution for CID 16237
* Rev 5: Minor updates when the doc was presented during TGbe MAC call 5/4/23
	+ CIDs 18269 and 15009 are deferred.
* Rev 6: Updated resolution for CIDs 18269 and 15009 based on offline discussions with several members.

***TGbe editor: Baseline for this document is 11be D3.1***

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.

***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** | **Pg.Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 18189 | Gaurav Patwardhan | 35.3.3.1 | 481.21 | "multi-link probe response or not" is not very definitive. Reword to say "probe response or multi-link probe response". | As in comment | **Revised**Most instances in the draft refer to the non-ML probe response. Therefore, the NOTE is updated to remove ‘or not’. In other words, the NOTE clarifies that the behavior described in the previous paragraphs apply to non-ML and ML probe response.**TGbe editor, please update NOTE 1 as:** “NOTE 1—The Probe Response frame referred in the above paragraphs can be a multi-link probe response.” |
| 16081 | Insun Jang | 35.3.3.1 | 482.01 | To understand clearly in NOTE 5, "a requested link" wouldn't include the link where the (Re)Association Request frame is transmiteed (The corresponding link is also one of requested links) | As in the comment, the corresponding link should be excepted as "a requested link" in terms of Link Info | **Revised**Agree with the comment. NOTE 5 is updated to clarify that the requested non-AP STA is other than the one where the Request frame is sent.**TGbe editor, please update NOTE 5 as: “**NOTE 5—A non-AP STA affiliated with a non-AP MLD … and includes Link Info field containing complete profile(s) of the non-AP STA(s), other than the non-AP STA that is operating on the link where the frame is transmitted, that are operating on the requested link(s) ....” |
| 16755 | Mark RISON | 35.3.3.2 | 482.23 | "A link ID is a numeric value that corresponds to a tuple consisting of Operating Class, Operating Channel,and BSSID of the AP affiliated with the AP MLD. Each AP affiliated with an AP MLD has a link ID that issmaller than 15." -- I'm guessing it has to be an integer and can't be negative | Change to "A link ID is a integer value between 0 and 14 that corresponds to a tuple consisting of Operating Class, Operating Channel,and BSSID of the AP affiliated with the AP MLD. Each AP affiliated with an AP MLD has a link ID." | **Revised****Agree with the comment. TGbe editor, please implement the proposed change while changing ‘a integer’ to ‘an integer’.** |
| 16236 | Stephen McCann | 35.3.3.2 | 482.24 | The Link ID should not be restricted to 15. There is no justification within the standard for this. It is possible for enterprise deployments to have MLDs with more than 15 links. | Change the initial sentence of the clause to:"A link ID is a numeric value that corresponds to a tuple consisting of Operating Class, Operating Channel, and BSSID of the AP affiliated with the AP MLD. Each AP affiliated with an AP MLD has a link ID." | **Rejected**The Link ID subfield is 4 bits long and can represent 16 values 0 thru 15. The value 15 (all 1s) has special meaning (see 9.4.2.170.2). Therefore, an AP MLD can only assign values less than 15 to its affiliated APs. |
| 16237 | Stephen McCann | 35.3.3.2 | 482.31 | The Link ID should not be restricted to 15. There is no justification within the standard for this. The note needs to be updated. | Change NOTE 1 as follows:"NOTE 1--The Link ID subfield in Reduced Neighbour Report element is set to 15 to indicate an AP that is not affiliated with an AP MLD or if the reporting AP does not have information of the reported AP (see 9.4.2.170.2 (Neighbour AP Information field)). Therefore, an AP MLD does not assign link ID value 15 to any of its affiliated AP." | **Revised**The suggested change in the comment doesn’t seem to be making any change to the existing NOTE. Regarding the comment, please see resolution for CID 16236. The cited NOTE is simplified as a resolution to this comment. In addition, NOTE 5 in clause 9.4.2.45 in baseline spec is updated to say that MLD Parameters subfield doesn’t apply to all the BSSIDs.**TGbe editor, please update the cited NOTE 1 as:**“NOTE 1—An AP MLD does not assign link ID value 15 to any of its affiliated APs since the value 15 is used in the Link ID subfield of Reduced Neighbor Report element to identify a reported AP that is not affiliated with an AP MLD or whose information is not known.”**In addition, please update NOTE 5 after the 7th paragraph in clause 9.4.2.45 (Multiple BSSID set) [baseline spec] as follows:**“NOTE 5—A Reduced Neighbor Report element is not carried in the Nontransmitted BSSID Profile subelement. When present in ~~the~~a frame that carries the Multiple BSSID element~~,~~ the values of fields contained in the Reduced Neighbor Report element, except the Same SSID and MLD Parameters subfield~~(~~s~~)~~ apply to all the BSSs in the multiple BSSID set.” |
| 16756 | Mark RISON | 35.3.3.2 | 482.33 | "Therefore, an AP MLD does not assign link ID value 15 to any of its affiliated AP." I'm not sure we need to justify this (and it should be "affiliated APs") | Delete | **Revised**Agree with the comment. The NOTE was updated as a resolution for CID 16237 and the issue pointed by the comment has been addressed in the revised text.TGbe editor, please update NOTE 1 as:“NOTE 1—An AP MLD does not assign link ID value 15 to any of its affiliated APs since the value 15 is used in the Link ID subfield of Reduced Neighbor Report element to identify a reported AP that is not affiliated with an AP MLD or whose information is not known.” |
| 18269 | Xiaofei Wang | 35.3.3.2 | 482.31 | The sentence "A link ID is a numeric value that corresponds to a tuple consisting of Operating Class, Operating Channel, and BSSID of the AP affiliated with the AP MLD." conflicts with Note 2 on Page 482, since Link ID will no longer correspond with the Operating Channel after channel switch. Please reconcile the two. | as in comment | **Revised**Agree in principle. The text is updated to tie Link ID to an affiliated AP’s BSSID only – i.e., no need to tie it to Op Class and Op Channel. This approach will also simplify the rules and the spec text – i.e., it remains the constant if (extnd)channel switch operation is performed or ML reconfig remove/add is performed. It also preserves the existing spec text that the Link ID remains constant thru the lifetime of the BSS and any other BSS of the MLD.**TGbe editor, please make change as shown in 11-23/0643r6 tagged 18269** |
| 15009 | Jay Yang | 35.3.3.2 | 482.36 | need add some clarification whether the link ID can be changed via ML recofiguration?e.g. one link is removed, and add back, the link ID may be changed. | as the comments | **Revised**A NOTE is added to clarify that an AP MLD assigns the same link ID when an affiliated AP that was previously removed is added back. **TGbe editor, please make change as shown in 11-23/0643r6 tagged 15009** |
| 16758 | Mark RISON | 35.3.3.2 | 482.38 | "In addition,the link ID for an AP affiliated with an AP MLD is the same across all non-AP MLDs." is unclear. The link ID is a property of the AP, and non-AP MLDs just have to use it | Delete | **Revised**Agree with the comment. The suggested sentence is deleted. However, NOTE 3 is updated to clarify that a non-AP MLD identifies each affiliated AP and the associated link via its assigned Link ID value.**TGbe editor, please delete the sentence starting** “In addition, the link ID …” **from NOTE 2 and update NOTE 3 as follows:** “NOTE 3—A non-AP MLD obtains the Link ID assigned to an affiliated AP (and the link that the AP is operating on) during discovery and uses this value for all multi-link operations that involve this affiliated AP.” |
| 18270 | Xiaofei Wang | 35.3.3.2 | 482.39 | It is not clear what the sentence "the link ID for an AP affiliated with an AP MLD is the same across all non-AP MLDs." means, please clarify | as in comment | RevisedSame resolution as CID 16758, i.e., “The suggested sentence is deleted. However, NOTE 3 is updated to clarify that a non-AP MLD identifies each affiliated AP and the associated link via its assigned Link ID value.”**TGbe editor, please delete the sentence starting** “In addition, the link ID …” **from NOTE 2 and update NOTE 3 as follows:** “NOTE 3—A non-AP MLD obtains the Link ID assigned to an affiliated AP (and the link that the AP is operating on) during discovery and uses this value for all multi-link operations that involve this affiliated AP.” |

**35.3.3.2 Link ID**

***TGbe editor: Please update the following paragraph and add the follow NOTE in this subclause as shown below:***

[18269]A link ID is an integer value between 0 and 14 that identifies an AP affiliated with the AP MLD based on that AP’s BSSID. Since the BSSID of each affiliated AP is different (see 35.3.2), an AP affiliated with an AP MLD shall not have the same link ID as another AP affiliated with the same AP MLD. The link ID associated with a specific BSSID shall not change for the lifetime of the BSS that is set up on the link associated with the link ID nor for the lifetime of any BSS of the other AP(s) affiliated with the same AP MLD. To have a low overhead in Management frames that carry link ID (or a link ID bitmap) an AP MLD should assign to each of its affiliated AP the lowest available link ID value.

[15009]NOTE – Since the Link ID of an affiliated AP is based on its BSSID, the same link ID is assigned to that affiliated AP when that AP is removed and added back at a later time by following the procedures described in 35.3.6 (Multi-Link reconfiguration)).