IEEE P802.11
Wireless LANs

|  |
| --- |
| Resolution for CID 3018 |
| Date: February 16, 2023 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Gaurang Naik |  |  |  |
| Pooya Monajemi | Cisco Systems |  |  |  |
| Brain Hart |  |  |  |
| Gaurav Patwardhan | HPE |  |  |  |

 Abstract

This submission proposes resolution for CID 3018 received against REVme D2.0 during LB270.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Minor updates when the doc was presented on 3/15/23 REVme AM2 session.

***TGm editor: Please note baseline for this document is REVme D2.1***

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 TGm Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGm Draft (i.e., they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGm Editor: Editing instructions preceded by “TGm Editor” are instructions to the TGm editor to modify existing material in the TGm draft. As a result of adopting the changes, the TGm editor will execute the instructions rather than copy them to the TGm Draft.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 3018 | Abhishek Patil | 2345.10 | 11.1.3.8.1 | There can be scenarios where the BSS corresponding to the transmitted BSSID needs to be turned off. In such case, the entire multiple BSSID set needs to be taken down and all non-AP STAs associated with any AP within the set need to be disassociated. This is disruptive. The standard needs to provide a mechanism for seamlessly handing over transmitted BSSID role so that the set can continue and non-AP STAs can maintain their association. | As in comment | **Revised**Agree with the comment. The proposed resolution provides a mechanism for an AP to keep the multiple BSSID set operational even if the transmitted BSSID is deactivated by handing over the role of transmitted BSSID to another AP (i.e., an active nontransmitted BSSID) within the same set.**TGm editor, please implement changes as shown in 11-23/0238r1** |

* Extended Capabilities element

***TGm editor: Please add a new row to Table 9-190 as shown below:***

|  |
| --- |
| * Extended Capabilities field
 |
| Bit | Information | Notes |
| <ANA> | Multiple BSSID Role Switch Support | A STA that has dot11MultiBSSIDImplemented equal to true sets this field to 1 to indicate support for the procedure described in 11.1.3.8.6 (Multiple BSSID Index Adjustment Procedure). Otherwise, this field is set to 0. |

* **Multiple BSSID Configuration element**

***TGm editor: Please update Figure 9-899 as shown below:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | BSSID Count | Full Set Rx Periodicity | Index Adjustment Factor | Index Adjustment TBTT Count |
| Octets: | 1 | 1 | 1 | 1 | 1 | 0 or 1 | 0 or 1 |
| **Figure 9-899 – Multiple BSSID Configuration element format** |

***TGm editor: Please add the following paragraphs after the paragraph starting “Full Set Rx Periodicity field indicates …” as shown below:***

The Index Adjustment Factor field if present is set to the value by which the BSSID index of each BSSID in a multiple BSSID set will be adjusted according to the procedures defined in 11.1.3.8.6 (Multiple BSSID Index Adjustment Procedure). The value 0 indicates there is no adjustment.

The Index Adjustment TBTT Count field is present if and only if the Index Adjustment Factor field is present and is nonzero, and is set to the number of TBTTs until a BSSID index adjustment occurs (as described in 11.1.3.8.6 (Multiple BSSID Index Adjustment Procedure)). A value of 1 indicates that the switch occurs at the next TBTT, and the corresponding Beacon, DMG Beacon or S1G Beacon frame is transmitted by the BSSID whose adjusted BSSID index value is 0 (i.e., the BSSID that takes on the transmitted BSSID role). The value 0 is reserved.

***TGm editor: Please ­add a new section after 11.1.3.8.5 as shown below:***

* + - * 1. **Multiple BSSID Index Adjustment Procedure**

This subclause describes the procedure to adjust multiple BSSID index (see 9.4.2.73 (Multiple BSSID-Index element)) values for each BSSID in a multiple BSSID set, which will result in a different BSSID in the set taking over the role of the transmitted BSSID. The procedure helps ensures that the multiple BSSID set continues to operate even if the AP corresponding to the transmitted BSSID no longer operates its BSS or intends to relinquish the role of being the transmitted BSSID.

An AP that supports the procedure described in this subclause sets the Multiple BSSID Role Switch Support subfield in the Extended Capabilities element to 1. A non-AP STA that supports computing the new BSSID index upon receiving the Index Adjustment Factor field sets the Multiple BSSID Role Switch Support subfield in the Extended Capabilities element to 1. The rest of this subclause is written with the assumption that the transmitting AP and receiving non-AP STA(s) support this feature.

NOTE 1 – An AP can use mechanisms such as BSS transition management to disassociate non-AP STA(s) that do not support this feature.

An AP corresponding to a transmitted BSSID in a multiple BSSID set shall include the Index Adjustment Factor field in the Multiple BSSID Configuration element (see 9.4.2.260 (Multiple BSSID Configuration element)) in the Beacon, DMG Beacon, S1G Beacon and Probe Response frames it transmits until the time when the adjustment occurs to inform non-AP STAs associated with all the APs in the multiple BSSID set that a BSSID index adjustment is imminent. The time advertised in the Index Adjustment TBTT Count field should be long enough that all non-AP STAs associated with the APs in the multiple BSSID set, including non-AP STAs in power save mode, have an opportunity to receive at least one Multiple BSSID Configuration element carrying the Index Adjustment Factor field before the adjustment takes effect.

At the TBTT indicated by the Index Adjustment TBTT Count field of the Multiple BSSID Configuration element used to advertise a multiple BSSID index adjustment, the index for each BSSID belonging to the multiple BSSID set is updated as follows:

New Index = (Old Index + *iaf*) mod 2*n*

where *n* is the MaxBSSID Indicator field in the Multiple BSSID element and *iaf* is the Index Adjustment Factor field in the Multiple BSSID Configuration element.

Following the adjustment:

* The BSSID whose new index value is 0 is the transmitted BSSID, and subsequent Beacon, DMG Beacon, S1G Beacon and Probe Response frames shall be transmitted by the AP corresponding to this BSSID.
* The BSSID Index field in each Multiple BSSID-Index element advertises the new index value for that nontransmitted BSSID.

The value carried in the Index Adjustment Factor field shall be selected such that an index belonging to an active nontransmitted BSSID is updated to the value 0.

NOTE 2—The procedure makes no change to the BSSIDs (i.e., the MAC addresses) of the corresponding Aps. Only the index within the multiple BSSID set is rotated such that a former nontransmitted BSSID with an updated index value of 0 takes on the role of the transmitted BSSID.

NOTE 3—Indication of buffered group addressed frames for each BSSID belonging to the multiple BSSID set (as described in 9.4.2.5 (TIM element)) will follow the newly assigned multiple BSSID index values updated according to this subclause.

NOTE 4—For example, if we start with *n* = 3, transmitted BSSID = 8c-fd-0f-7f-1e-f5, and two nontransmitted BSSIDs BSSID(2) = 8c-fd-0f-7f-1e-f7 and BSSID(5) = 8c-fd-0f-7f-1e-f2, then an *iaf* of 6 will convert the BSSID 8c-fd-0f-7f-1e-f7 to index (2+6) mod 23=0 as the transmitted BSSID, and the other BSSID index values are updated as BSSID((5+6) mod 23=3) = 8c-fd-0f-7f-1e-f2 and BSSID((0+6) mod 23=6) = 8c-fd-0f-7f-1e-f5 where the latter BSSID is converted into a nontransmitted BSSID.

* TIM Broadcast

***TGm editor: Please ­add a new bullet to the 11th paragraph as shown below:***

The AP shall increase the value (modulo 256) of the Check Beacon field in the next transmitted TIM frame(s) when a critical update occurs to any of the elements inside the Beacon frame. The following events shall classify as a critical update:

…

s) Insertion of an Index Adjustment Factor field in a Multiple BSSID Configuration element