IEEE P802.11
Wireless LANs

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| TBD and CR for Group addressed frames |
| Date: Mar 20, 2021 |
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 Abstract

This submission proposes resolutions for following 2 CIDs received for TGbe CC34:

2499 2502

Regarding the group addressed BU indication for AP MLD, the mapping between the contiguous bits in Partial Virtual Bitmap field and each affiliated AP are TBD. Fix this TBD

Revisions:

* Rev 0: Initial version of the document.

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.***

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| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Page | Clause | Comment | Proposed Change | Resolution |
| 2499 | Po-Kai Huang | 141.11 | 35.3.12.2 | There is nothing special on group addressed management frame delivery. Each AP of an AP MLD just follows baseline to deliver in each link. | Each AP of an AP MLD just follows baseline to deliver group addressed management frame in each link. | Revised-Agree with the comment partially, the group addressed Management frame delivery is independent on each link. Regarding the group addressed BU indication for AP MLD, propose resolution to clarify the mapping between the contiguous bits in Partial Virtual Bitmap field and each affiliated AP.TGbe editor:Please implement changes as shown in doc 11-21/0740r0 tagged as 2499 |
| 2502 | Po-Kai Huang | 141.01 | 35.3.12 | Group address management frame reception behavior shall be the same as group addressed data frame reception behavior for non-AP MLD since in each link, AP MLD just delivers everything based on baseline. | Create subclause for reception behavior and add thef following. "If a non-AP MLD intends to receive group addressed frame, the non-AP MLD shall follow the baseline rules to receive the group address frames on any one link that the non-AP MLD selects to receive group addressed frames" | Revised-Agree with the comment in general, the group addressed frame reception behavior at the non-AP MLD side has be added by 21/349r3 and 21/257r3.TGbe editor:No further changes are needed to address this comment.  |

***TGbe editor: Please note baselines are REVmd D5.0, 11ax D8.0 and 11be D0.4***

Discussion

Regarding the group addressed BU indication for AP MLD, the mapping between the contiguous bits in Partial Virtual Bitmap field and each affiliated AP is TBD

There are two options for mapping

Opt 1: in increasing order of link id of each AP

It requires link ID of each AP to be unique within the MLD which includes the transmitting AP (take BSSID-1x for example), like MLD 1 in the fig., and the MLDs which include the nontransmitted BSSID in the same multiple BSSID set as the transmitting AP, like MLD 3 in the fig. If there are multiple MLDs, then the space of Link ID may be not enough.

According to the draft 0.4, link IDs shall be unique within one MLD. So the above requirement is not met.

Opt 2: in increasing order of MAC address of each AP

Since the MAC address of each AP is unique, no any further requirement is needed



**35.3.12 Multi-link group addressed frame delivery and reception**

**35.3.12.2 Group addressed frame delivery**

***TGbe editor: Please modify the subclause as follows*** Each AP affiliated with an AP MLD shall schedule for transmission buffered group addressed frames immediately after every DTIM beacon except that a TWT scheduling AP affiliated with that AP MLD shall schedule for transmission the buffered group addressed frames during the broadcast TWT SPs located within the beacon interval during which the DTIM Beacon frame is transmitted (see 26.8.3.2 (Rules for TWT scheduling AP)).Each AP affiliated with an AP MLD shall schedule:

—the transmission of the buffered group addressed Management frames independently from the transmission of buffered group addressed Management frames of other AP(s) affiliated with the same AP MLD.

—the transmission of the buffered group addressed data frames that are expected to be received by a non-AP MLD in all the links setup with the non-AP MLD.

If an AP affiliated with an AP MLD is not part of a multiple BSSID set or the AP corresponds to a transmitted BSSID in a multiple BSSID set, then the AP shall indicate if each of the other AP(s) in the same AP MLD has buffered group addressed frames by using a bit in the Partial Virtual Bitmap field of the TIM element after the last bit corresponding to a nontransmitted BSSID (if any) (maximum possible number of BSSIDs – 1) which is in the same multiple BSSID as the AP.

—The indication is in the DTIM beacon sent by the AP and is based on the latest information about the other APs that the AP has when the AP schedules the DTIM beacon.

—These bits in the Partial Virtual Bitmap field of the TIM element for the other AP(s) in the same AP MLD shall be contiguous.

* The bits M to M+N-1 of the bitmap in the Partial Virtual Bitmap field are used to indicate that one or more group addressed frames are buffered for each AP of the other AP(s) in the same AP MLD in increasing order of their MAC addresses where M-1 is the last bit corresponding to the nontransmitted BSSID (if any) which is in the same multiple BSSID as the AP, and N is the number of affiliated APs in this AP MLD (#CID 2499)

NOTE—The AP indicates the presence of its buffered group addressed frames following 11.2.3.6 (AP operation).

If an AP affiliated with an AP MLD is a nontransmitted BSSID in a multiple BSSID set, then the AP that corresponds to the transmitted BSSID in the same multiple BSSID set shall indicate if each of the other AP(s) in the same AP MLD as the nontrasnmitted BSSID has buffered group addressed frames by using a bit in the Partial Virtual Bitmap field of the TIM element after the last bit corresponding to the nontransmitted BSSID (if any) (maximum possible number of BSSIDs – 1) which is in the same multiple BSSID as the AP.

—The indication is in the DTIM beacon corresponding to that nontransmitted BSSID sent by the transmitted BSSID of the same multiple BSSID set as the nontransmitted BSSID and is based on the latest information about the other APs of the AP MLD that the transmitted BSSID has when it schedules the DTIM beacon.

—These bits in the Partial Virtual Bitmap field of the TIM element for the other AP(s) in the same AP MLD shall be contiguous. For the kth nontransmitted BSSID affiliated with an MLD where k is numbered in increasing order of MLD ID of this MLD and starts from 1,

* if the AP that corresponds to the transmitted BSSID is not affiliated with an AP MLD, then the bits to of the bitmap in the Partial Virtual Bitmap field are used to indicate that one or more group addressed frames are buffered for each AP of the other AP(s) in the same AP MLD as the kth nontransmitted BSSID in increasing order of their MAC addresses where M-1 is the last bit corresponding to the nontransmitted BSSID (if any) which is in the same multiple BSSID as the AP that corresponds to the transmitted BSSID, and (i>0) is the number of affiliated APs in the AP MLD with which the ith nontransmitted BSSID is affiliated and is equal to 0
* if the AP that corresponds to the transmitted BSSID is affiliated with an AP MLD, then the bits to of the bitmap in the Partial Virtual Bitmap field are used to indicate that one or more group addressed frames are buffered for each AP of the other AP(s) in the same AP MLD as the nontransmitted BSSID in increasing order of their MAC addresses where M-1 is the last bit corresponding to an AP affiliated with the same AP MLD as the AP that corresponds to the transmitted BSSID, and (i>0) is the number of affiliated APs in the AP MLD with which the nontransmitted BSSID is affiliated and is equal to 0 (#CID 2499)