IEEE P802.11
Wireless LANs

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| Proposed Draft Text for group addressed frame |
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Abstract

This submission proposes draft text for TWT for MLD

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Minor change
* Rev 2: Modification based on the received comments from Mark and Alfred

**The texts are based on the following motion**

802.11be agrees that each AP in an AP MLD shall independently transmit all bufferable group addressed Management frames after every DTIM beacon in R1.

[Motion 131, #SP206, [21] and [240]]

The followings are supported in R1:

* A group addressed data frame that is expected to be received by the non-AP MLD shall be scheduled for transmission in all the links setup with the non-AP MLD.

[Motion 144, #SP327, [26] and [241]]

In R1, an AP affiliated with an AP MLD shall indicate if each AP in the same AP MLD has buffered group addressed frames by using the existing TIM element.

* If the AP is not part of a multiple BSSID set or if the AP is part of a multiple BSSID set and is a transmitted BSSID, then the indication is in the DTIM beacon sent by the AP and is based on the latest information about the other APs that it has when the AP schedules the DTIM beacon.
* If the AP is a nontransmitted BSSID in a multiple BSSID set, then 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 AP and is based on the latest information about the other APs that the transmitted BSSID has when it schedules the DTIM beacon.

[Motion 146, #SP353, [30] and [251]]

***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.***

***Discussion: an exception for group addressed frame deliver which is not sent as described in 802.11ax D5.0***

***In 26.8.3.2 Rules for TWT scheduling AP***

A TWT scheduling AP that has advertised a broadcast TWT with a Broadcast TWT ID equal to 0 shall schedule the following:

— The delivery of group addressed DL BUs during the broadcast TWT SPs located within the beacon interval that follows the DTIM Beacon frame if the TWT parameter set indicated non-trigger enabled unannounced TWT SP and had the Broadcast TWT Recommendation subfield equal to 0.

***TGbe Editor: please add Clause 35.3.11.2 as follows:***

35.3.11 Multi-link group addressed frame delivery

35.3.11.2 Group addressed frame

Each AP in an AP MLD shall transmit buffered group addressed frames immediately after every DTIM beacon except that a TWT scheduling AP within that AP MLD shall transmit the buffered group addressed frames during the broadcast TWT SPs located within the beacon interval during which the DTIM Beacon frame is transmitted as described in subclause 26.8.3.2 (Rules for TWT scheduling AP). Each AP in an AP MLD shall schedule the following:

* Transmit the buffered group addressed Management frames independently from the other AP(s) affliciated with the same AP MLD
* Transmit the buffered group addressed data frames that are expected to be received by the 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 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 the nontransmitted BSSID (if any) 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 it has when the AP schedules the DTIM beacon
* The bits in the Partial Virtual Bitmap field of the TIM element for the other AP(s) in the same AP MLD shall be contiguous ~~and the bits M to M+N-1 of the bitmap 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 link IDs 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~~

NOTE - The AP indicates the presence of its buffered group addressed frames following subclause 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) which is in the same multiple BSSID as the AP

* The indication is in the DTIM Beacon corresponding to that non-transmitted 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
* The bits in the Partial Virtual Bitmap field of the TIM element for the other AP(s) in the same AP MLD shall be contiguous ~~and the bits M to M+N-1 of the bitmap 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 link IDs 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~~