IEEE P802.11
Wireless LANs

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| Proposed Draft TextMAC MLO Power Save: Traffic Indication |
| Date: 2020-8-24 |
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Abstract

This submission proposes draft text to be included in 802.11be Draft 0.1 for the following topic:

* MAC MLO power save – traffic indication
	+ Includes draft text for [Motion 52], [Motion 106], [Motion 115, #SP61], [ Motion 115, #SP62], and [ Motion 122, #SP157]
* An AP of an AP MLD may transmit on a link a frame that carries an indication of buffered data for transmission on other enabled link(s).

[Motion 52, [24] and [152]]

* An AP MLD can recommend a non-AP MLD to use one or more enabled links.
	+ The AP’s indication could be carried in a broadcast or a unicast frame.

[Motion 106, [24] and [153]]

* A bit in a partial virtual bitmap of a TIM element that corresponds to a non-AP MLD is set to 1 if any individually addressed BUs for the non-AP MLD are buffered by the AP MLD.

[Motion 115, #SP61, [12] and [154]]

* When a non-AP MLD made a multi-link setup with an AP MLD, one AID is assigned to the non-AP MLD across all links.

[Motion 115, #SP62, [12] and [154]]

* A non-AP MLD shall have the same U-APSD Flag value for each AC across all links that multi-link is setup. This is for R1.

[Motion 122, #SP157, [8] and [155]]

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised the 1st paragraph of subclause 33.3.6.1 Traffic indication to contain only EHT related text and not legacy operation
* Rev 2: Updated based on the comments from multiple members (Ahbi, Laurent, et.al.); added draft text based on Motion 52 and Motion 106 (comment from Laurent)
* Rev 3: Updated based on the comments from Abhi
* Rev 4: Updated based on the comment from Ming

**TGbe editor: Modify the following subclause as follows**

* TIM element
* General

Change the last paragraph in page 998 as follows (based on the paragraph from P802.11REVmd D4.0):

When the TIM is carried in a non-S1G PPDU(11ah), the traffic indication virtual bitmap, maintained by the AP or the mesh STA that generates a TIM, consists of 2008 bits, and it is organized into 251 octets such that bit number *N* (0 £ *N* £ 2007) in the bitmap corresponds to bit number (*N* mod 8) in octet number ë*N* / 8û where the low order(M101) bit of each octet is bit number 0, and the high order bit is bit number 7. (#4507)When the TIM is carried in an S1G PPDU, the traffic-indication virtual bitmap has the hierarchical structure shown in Figure 9-152 (Hierarchical structure of traffic-indication virtual bitmap carried in an S1G PPDU(#2001)(11ah)). (#2001)Each bit in the traffic indication virtual bitmap corresponds to traffic buffered for a specific neighbor peer mesh STA within the MBSS that the mesh STA is prepared to deliver26, or for a STA that is not affiliated with an MLD within the BSS that the AP is prepared to deliver at the time the Beacon frame is transmitted, or for a non-AP MLD that the AP MLD with which the AP is affiliated is prepared to deliver at the time the Beacon frame is transmitted. Bit number *N* indicates the status of buffered, individually addressed MSDUs/MMPDUs for the STA or the non-AP MLD whose AID is *N*, or group addressed MSDUs/MMPDUs for the STAs whose group AID is *N*.(11ah) It is set as(#4678) follows:

* Power management with APSD
* Power management with APSD procedures

Add the following paragraph after the third paragraph in page 2175 (based on the paragraph from P802.11REVmd D4.0):

A STA may set an AC to be trigger- or delivery-enabled for its own use by setting up TSPECs with the APSD subfield set to 1 and the Schedule subfield set to 0 in the uplink or downlink direction, respectively. An uplink TSPEC plus a downlink TSPEC, or a bidirectional TSPEC with the APSD subfield equal to 1 and the Schedule subfield equal to 0, makes an AC both trigger- and delivery-enabled. An uplink TSPEC plus a downlink TSPEC, or a bidirectional TSPEC with the APSD and the Schedule subfields both equal to 0, makes an AC neither trigger- nor delivery-enabled.

If a STA is affiliated with a non-AP MLD, the non-AP MLD shall have the same U-APSD Flag value for each AC across all setup links (see 33.x.x. Multi-link setup).

***TGbe editor: Insert the new subclause 33.3.6 Power save as follows:***

**33.3.6 Power save**

**33.3.6.1 Traffic indication**

An AP MLD shall assign a single AID to a non-AP MLD upon successful multi-link setup. All the STAs of the non-AP MLD shall have the same AID as the one assigned to the non-AP MLD during multi-link setup.

The TIM element carried in the Beacon frame transmitted by an AP of an AP MLD shall identify the non-AP MLDs for which traffic is pending and buffered at the AP MLD. This information is coded in a *partial virtual bitmap*, as described in 9.4.2.5 (TIM element). The TIM element carried in the Beacon frame transmitted by an AP of an AP MLD shall identify those non-AP MLDs for which traffic is pending and buffered at the AP MLD by setting bits in the TIM’s partial virtual bitmap to 1 that correspond to the AIDs of the non-AP MLDs.

An AP of an AP MLD may transmit on a link a frame that carries an indication of buffered data for transmission on other enabled link(s). The format of the indication is TBD.

An AP MLD may recommend a non-AP MLD to use one or more enabled links. The AP’s indication may be carried in a broadcast or a unicast frame. The format of the indication is TBD.