IEEE P802.11
Wireless LANs

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| Bugfixes related to MBSSID traffic indication |
| Date: April 30, 2024 |
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 Abstract

This submission adds text to various sections of the 802.11 standard to provide clarification on the traffic indication when the AP transmitting the TIM element is a transmitted BSSID in a multiple BSSID set. These changes are based on discussions that were triggered during the comment resolution process (CID 7218).

**Revisions:**

* Rev 0: Initial version of the document.

***TGm editor: Baseline for this document is REVme D5.0 and 11-24/0702r2.***

Text based on 11-24/0702r2 are highlighted in green.

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.

***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.***

**Fix 1:** While discussing the resolution for CID 7218 it was determined that the spec needs to provide guidance on how an AP corresponding to a transmitted BSSID sets various fields within the TIM element and the corresponding behavior at the receiving non-AP side.

* General

***TGm editor, please update NOTE 1 in this subclause as shown below:***

NOTE 1—When dot11MultiBSSIDImplemented is not true, the bit numbered 0 in the traffic indication virtual bitmap need not be included in the Partial Virtual Bitmap field even if that bit is set.

**11.1.3.8.5 Traffic advertisement in a multiple BSSID set**

***TGm editor, please make the following changes to the 1st paragraph in this subclause:***

The Partial Virtual Bitmap field of the TIM element carried in the Beacon, S1G Beacon, or TIM frame shall indicate the presence or absence of traffic to be delivered to all stations associated with an AP corresponding to a transmitted or nontransmitted BSSID. The first 2*n* bits of the bitmap are reserved for the indication of group addressed frame for the transmitted and all nontransmitted BSSIDs (see 9.4.2.5.1 (General)). The Traffic Indicator field of the Bitmap Control field shall be set to 1 to indicate that one or more non-GCR-SP non-SYNRA group addressed frames are buffered at the AP corresponding to the transmitted BSSID. The field corresponding to a NonTxBSS ID (i.e., a bit position between 1 and 2n – 1 of the Partial Virtual Bitmap field matching the BSSID index of a nontransmitted BSSID) shall be set to 1 to indicate that one or more non-GCR-SP non-SYNRA group addressed frames are buffered at the AP corresponding to that nontransmitted BSSID. See Annex L for examples of traffic indication (including that for group addressed frames) in a multiple BSSID set. The AID space is shared by all BSSs and the lowest AID value that shall be assigned to a non-S1G STA is 2*n* (see 9.4.2.5 (TIM element)). The value of the 11 LSBs of the AID assigned to an S1G STA shall be greater than 2*n*. The Encoded Blocks that contain these first 2*n* AIDs (if any) shall precede the Encoded Blocks that contain AIDs for the S1G STAs in the S1G Partial Virtual Bitmap field of each page. Each BSS of the Multiple BSSID set may have a different DTIM interval, which is signaled in the DTIM Period and DTIM Count fields that are present in the Multiple BSSID-Index element carried in the nontransmitted BSSID profile for that BSS.

NOTE – When the TIM element is carried in a non-S1G PPDU, the bit numbered 0 (i.e., the one corresponding to AID 0) of the Partial Virtual Bitmap field is be set to the same value as the Traffic Indicator field of the Bitmap Control field.

* AP operation

***TGm editor, please update the following bullet in this subclause as shown below:***

* If a STA has set up a scheduled SP the APSD-capable AP shall transmit frames associated with admitted traffic with the APSD subfield equal to 1 in the TSPECs buffered for the STA during a scheduled SP. If the STA has set up to use unscheduled SPs, the AP shall buffer BUs using delivery-enabled ACs until it has received a trigger frame using a trigger-enabled AC from the non‑AP STA, which indicates the start of an unscheduled SP. A trigger frame received by the AP from a STA that already has an unscheduled SP underway shall not trigger the start of a new unscheduled SP. The AP transmits BUs destined for the STA and using delivery-enabled ACs during an unscheduled SP.

NOTE 1—Transmission of BUs during an unscheduled SP is constrained by the max SP length.

NOTE 2—The AC for delivery of an MMPDU (see 10.2.3.2 (HCF contention based channel access (EDCA))) determines whether it is transmitted using a delivery-enabled AC during an unscheduled SP.

d1) For an AP with dot11MultiBSSIDImplemented not true, t For an AP with dot11MultiBSSIDImplemented set to true, the indication of group addressed traffic is described in 11.1.3.8.5 (Traffic advertisement in a multiple BSSID set).

* Receive operation for STAs in PS mode

***TGm editor, please update the following bullet in this subclause as shown below:***

* When dot11FMSActivated is false and ReceiveDTIMBeacons is true, the STA shall transition to awake state early enough to be able to receive either every non-STBC DTIM beacon or every STBC DTIM beacon sent by the AP of the BSS. The STA shall remain in the awake state to receive the group addressed MPDUs transmitted by the AP as described in 11.2.3.1 (General) and 11.2.3.4 (TIM types) when:
* the STA is associated with either an AP that has set to 0 the Multiple BSSID field of the Extended Capabilities element it transmits or corresponds to the transmitted BSSID in a multiple BSSID set, and the Traffic Indicator field in the TIM element in the DTIM beacon is equal to 1, or
* the STA is associated with an AP that corresponds to a nontransmitted BSSID in a multiple BSSID set, and the field corresponding to the NonTxBSS ID (i.e., a bit position between 1 to 2n – 1 of the Partial Virtual Bitmap field matching the BSSID index of a nontransmitted BSSID) in the TIM element is equal to 1 in the DTIM beacon of that nontransmitted BSSID.

**Fix 2:** To be consistent with clause 11.1.3.8.3 (see pg 2460 ln 16 of REVme D5.0), the spec text in 9.4.2.259 needs to clarify that the description for Full Set Rx Periodicity applies only to a scanning non-AP STA. Furthermore, a NOTE is added for consistency with another aspect described in clause 11.1.3.8.3 (see pg 2460 ln 37 of REVme D5.0).

9.4.2.259 Multiple BSSID Configuration element

***TGm editor, please update the following paragraph in this subclause as shown below:***

Full Set Rx Periodicity field indicates the least number of Beacon frames or DMG Beacon frames a scanning non-AP STA needs to receive in order to discover all the active nontransmitted BSSIDs in the set.

NOTE – An associated non-AP STA is expected to know the profile periodicity of its associated AP and when its associated AP’s profile is expected to be absent, the non-AP STA can choose to not process either the Beacon frame from the transmitted BSSID in the multiple BSSID set or the Multiple BSSID element within a Beacon frame from the transmitted BSSID.