IEEE P802.11
Wireless LANs

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| Resolution for CIDs related to multiple BSSID set |
| Date: May 13, 2021 |
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 Abstract

This submission proposes resolutions for CID related to multiple BSSID set received for TGm CC35:

3, 10, 133

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Updated list of co-authors
* Rev 2: Changes made when the doc was presented on REVme call on 10/29

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.***

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| **CID** | **Commenter** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 133 | Li-Hsiang Sun | 11.1.3.2 | 2121 | 23 | 11ax added an annex AA in which a nontransmitted BSSID profiles appears in beacon with a periodicity"Time 0 is defined to be a TBTT with the Beacon frame being a DTIM" does not seem to be correct for a nonTransmitted BSSID | Time 0 is defined to be a TBTT with the Beacon frame being a DTIM for a transmitted BSSID | **Revised**Agree with the comment.The DTIM period for each BSSID in a multiple BSSID set is independently selected and can be different. The proposed change updates the cited sentence to refer to the DTIM Count field in the TIM IE being set to 0 (which is equivalent to the Beacon frame being a DTIM for the transmitted BSSID). A NOTE was added after the paragraph to clarify that that the DTIM Count field in the TIM IE indicates a countdown to the DTIM Beacon for the transmitted BSSID in a multiple BSSID set.Similar change is proposed in clause 11.1.3.10.2In addition, the sentences at both locations were updated to better express the intended meaning. The “time 0” reference is the very first Beacon frame which will have DTIM Count field of TIM element set to 0 (i.e., the very first beacon is a DTIM beacon).Furthermore, text was added to 11.1.3.8 to clarify that the DTIM Count and DTIM Period fields carried in the TIM element indicate the DTIM interval for the transmitted BSSID.**TGm editor, please incorporate changes as shown in doc 11-21/0844r2 tagged as [CID 133]** |
| 3 | Abhishek Patil | 11.1.3.8 | 2127 | 14 | When the Complete List of NonTxBSSID Profiles field is set to 1, the non-AP STA receives all the profiles in a single Beacon or Probe Response frame. Therefore the non-AP STA must not send (unnecessary) probes to the AP to discover 'additional' BSSIDs in the multiple BSSID set. The action on the non-AP STA side are not clearly specified. Convert the NOTE to normative text. | Replace the NOTE with the following normative text: "A non-AP STA shall have the ability to interpret the Complete List of NonTxBSSID Profiles field of Extended Capabilities element and shall not send a Probe Request frame to the AP to discovery nontransmitted BSSID in the multiple BSSID set if the AP's Beacon or Probe Response frame has set the Complete List Of NonTxBSSID Profiles field to 1. Otherwise, the non-AP STA may send a Probe Request frame to the AP to gather information about a BSSID in the multiple BSSID set when the AP advertises partial list of nontransmitted BSSID profiles and the information of that nontransmitted BSSID was not included in the Beacon or Probe Response frame." | **Revised**Agree with the comment. The behavior suggested by the NOTE should be specified as normative text so that the expected behavior at a non-AP STA is clear.The proposed change replaces the NOTE with a normative paragraph and clarifies that the non-AP STA could choose to listen for additional Beacon frames from the AP or send a Probe Request to the AP to gather information of nonTxBSSID(s) that were not includes in the most recent Beacon or Probe Response frame and are of interest to the STA **TGm editor, please incorporate changes as shown in doc 11-21/0844r2 tagged as [CID 3]** |
| 10 | Abhishek Patil | 11.52 | 2516 | 4 | The Beacon Protection procedure for the case of a multiple BSSID set is not clearly explained. | As in comment | **Revised**Agree with the comment. A NOTE was added after the 3rd paragraph in clause 11.52 to clarify that a STA associated with an AP corresponding to the nonTxBSSID receives the BIGTK from its associated (nonTxBSSID) and uses it to verify the contents of the Beacon frame transmitted by the AP corresponding to the TxBSSID.**TGm editor, please incorporate changes as shown in doc 11-21/0844r2 tagged as [CID 10]** |

***TGm editor, the baseline for this document is REVme 0.00***

* Beacon generation in non-DMG infrastructure networks

***TGm editor, please update the 1st paragraph in this clause as shown below:***

If the AP is a non-S1G AP, it shall define the timing for the entire BSS by transmitting Beacon frames according to dot11BeaconPeriod. If the AP is an S1G AP, it shall define the timing for the entire BSS by transmitting S1G Beacon frames according to dot11BeaconPeriod. This defines a series of TBTTs exactly dot11BeaconPeriod TUs apart. [CID 133]Time 0 is defined to be the TBTT when the first Beacon frame is expected to be sent and this beacon shall have the DTIM Count field of the TIM element set to 0. At each TBTT, the AP shall schedule a Beacon frame as the next frame for transmission according to the medium access rules specified in Clause 10 (MAC sublayer functional description).

NOTE 1—To achieve this requirement, the AP suspends any pending transmissions until the beacon has been transmitted. In the case of a DTIM, the AP also suspends any pending individually addressed transmissions until any pending group addressed transmissions have been performed (see 11.2.3.4 (TIM types)).

[CID 133]NOTE 2 – When dot11MultiBSSIDImplemented is true, the DTIM Count field in the TIM element applies to the AP corresponding to the transmitted BSSID.

* Generation of S1G Beacon frames

***TGm editor, please update the 2nd paragraph in this clause as shown below:***

[CID 133] Time 0 is defined to be the TBTT or TSBTT when the first S1G Beacon frame is expected to be sent and this beacon shall have the DTIM Count field of the TIM element set to 0. At each TBTT or TSBTT, the AP shall schedule an S1G Beacon frame as the next frame for transmission. At each TBTT or TSBTT the AP should suspend the decrementing of the backoff counter for any pending non-beacon transmission and transmit the S1G Beacon frame according to the medium access rules specified in Clause 10 (MAC sublayer functional description).

[CID 133]NOTE – When dot11MultiBSSIDImplemented is true, the DTIM Count field in the TIM element applies to the AP corresponding to the transmitted BSSID.

* **Multiple BSSID procedure**

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

***Additional instructions to editor: After 802.11ax is rolled-in, the paragraph below would be the 1st paragraph in 11.1.3.8.5 (Traffic advertisement in a multiple BSSID set):***

[CID 133]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 to a transmitted or nontransmitted BSSID. The first 2n 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)). 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 2n (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 2n. The Encoded Blocks that contain these first 2n 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.

NOTE - The DTIM Count and DTIM Period fields of the TIM element carried in the Beacon frame transmitted by an AP corresponding to the transmitted BSSID indicates the DTIM interval for the transmitted BSSID.

* **Multiple BSSID procedure**

***TGm editor, please replace the NOTE after the 2nd paragraph with a normative paragraph as shown below:***

***Additional instructions to editor: After 802.11ax is rolled-in, the (new) paragraph below shown below should appear after the 1st paragraph in 11.1.3.8.3 (Discovery of a nontransmitted BSSID profile):***

The nontransmitted BSSID profile shall include the SSID element (see 9.4.2.2 (SSID element)) and Multiple BSSID-Index element (see 9.4.2.73 (Multiple BSSID-Index element)) for each of the supported BSSIDs. The AP or PCP may include all other elements allowed per 9.4.2.45 (Multiple BSSID element) in the nontransmitted BSSID profile. The AP or PCP may include two or more Multiple BSSID elements containing elements for a given BSSID index in one Beacon frame or DMG Beacon frame. If two or more are given, the profile is considered to be the complete set of all elements given in all such Multiple BSSID elements sharing the same BSSID index. Since the Multiple BSSID element is also present in Probe Response frames, an AP or PCP may choose to advertise the complete or a partial profile of a BSS corresponding to a nontransmitted BSSID only in the Probe Response frames. In addition, the AP or PCP may choose to include only a partial list of nontransmitted BSSID profiles in the Beacon frame or DMG Beacon frame or to include different sets of nontransmitted BSSID profiles in different Beacon frames or DMG Beacon frames. An AP advertising a complete list of nontransmitted BSSID profiles shall set the Complete List Of NonTxBSSID Profiles field of Extended Capabilities element to 1.

[CID 3]

If the most recent Beacon or Probe Response frame transmitted by the AP corresponding to the transmitted BSSID has the Complete List Of NonTxBSSID Profiles field equal to 0, then a non-AP STA with dot11MultiBSSIDImplemented equal to true should listen for additional Beacon frames from the AP or may send a Probe Request frame to the AP to gather information about one or more nontransmitted BSSIDs in the multiple BSSID set whose profile is not carried in the frame and that are of interest to the non-AP STA.

* **Beacon frame protection procedures**

***TGm editor, please update the 3rd paragraph in this clause as shown below:***

If dot11BeaconProtectionEnabled is true and a non-AP STA receives a BIGTK from the AP with which it is associated, the non-AP STA shall enable beacon protection.

NOTE – In a multiple BSSID set, a non-AP STA receives BIGTK from its associated AP (which can correspond to either the transmitted BSSID or nontransmitted BSSID) and uses it for validating the contents of the Beacon frame transmitted by the AP corresponding to the transmitted BSSID.[CID 10]