IEEE P802.11
Wireless LANs

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| Comment resolutions for identifiers |
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Abstract

This submission proposes resolutions for multiple comments related to TGba D1.0 with the following CIDs (14 CIDs):

* 91, 98, 99, 397, 399, 620, 622, 825, 826, 827,
* 854, 863, 1126, 131

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Addresses some ambiguity for the case of MBSSID MIB set to false. Changes in green.
* Rev 2: Incorporated changes to address some comments received from Yunsong. Changes still in green since they are partially related to Rev 1. Also added CID 131 to the list.
* Rev 3: Incorporated feedback from Jeongki. Changes still in green.
* Rev 4: Clarified in a note that STAs associated to nontransmitted BSSID are expected to receive WUR beacons and WUR discovery frames sent to the transmitted BSSID (similar to baseline behaviour). Changes in this color.

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 TGba Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGba Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGba Editor: Editing instructions preceded by “TGba Editor” are instructions to the TGba editor to modify existing material in the TGba draft. As a result of adopting the changes, the TGba editor will execute the instructions rather than copy them to the TGba Draft.***

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| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 91 | Alfred Asterjadhi | 44.28 | What is the bit indicating in the case of multi-BSSID operation? Availability of group addressed BUs for the transmitting BSSID or for the non-transmitting BSSID? Or for all of them? | As in comment. | Revised –Agree in principle with the comment. Proposed resolution clarifies that the availability of the BUs is for the transmitting BSSID when the ID contains the transmitter ID and for the corresponding nontransmitted BSSID when the ID contains a nontransmitter ID. To enable this procedure a new normative behavior subclause is added to the draft which provides the same procedure as baseline AID computation for the BSS AIDs based on their indexing in the TIM element. This concept was discussed in detail in the following slide deck: <https://mentor.ieee.org/802.11/dcn/18/11-18-0514-02-00ba-addressing-in-wur-frames.pptx>. TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 91. |
| 98 | Alfred Asterjadhi | 49.45 | Please make it clearer that this is the transmitting BSSID when the AP has enabled MultiBSSI operation. | As in comment. | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggestion.TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 98. |
| 99 | Alfred Asterjadhi | 49.52 | How are the non-transmitting BSSIDs identified? Please clarify | As in comment. | Revised –Agree in principle with the comment. Proposed resolution clarifies that the transmitter ID identifies the AP corresponding to the transmitted BSSID when dot11MBSSIDActivated is true, and another set of identifiers (nontransmitter ID) identify the nontransmitted BSSID. For more details please refer to:<https://mentor.ieee.org/802.11/dcn/18/11-18-0514-02-00ba-addressing-in-wur-frames.pptx> TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 99. |
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| 397 | James Lepp | 49.49 | grammar: transmit ID --> transmitter ID |  | Revised –Note to TGba editor: No further changes are needed since it is already accounted for in D1.1 of TGba.TGba editor: Please replace “transmit ID” with “transmitter ID” throughout the draft. |
| 399 | James Lepp | 49.52 | You are mixing up "Address" and "ID"/identity/identifier throughout this section. Pick one and be consistent. |  | Revised –Agree with comment. Note to TGba editor: No further changes are needed since it is already accounted for in D1.1 of TGba.TGba editor: Please replace “Address field” with “ID field throughout this subclause. |
| 620 | Mark RISON | 50.31 | "the identifier's space" -- this is not defined | Define the WUR ID space | Revised –Agree in principle with the comment. Proposed resolution is to define the identifier’s space in the main subclause of this clause.TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 620. |
| 622 | Mark RISON | 50.24 | This is not the first place "WUR" is used | Expand "WUR" the first time it is used, not here | Revised –Agree with the comment (already expanded in title of clause 31). Proposed resolution is to remove the expansion.TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 622. |
| 825 | Po-Kai Huang | 49.44 | When Multiple BSSID element is used, the WUR AP may have BSSID equal to nontransmitted BSSID and does not transmit beacon. It is better to clarify that in this case, the compressed BSSID is computed according to the transmitted BSSID. | When the WUR AP is part of a multiple BSSID set, the compressed BSSID is computed based on transmitted BSSID. As a result, one WUR Beacon can be sent among the APs in the multiple BSSID set. | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggestion.TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 825. |
| 826 | Po-Kai Huang | 49.52 | When the WUR AP is in the multiple BSSID set, it maybe useful to have one WUR Beacon, but with separate broadcast addressed WUR frame to each BSS in the multiple BSSID set. | There are several ways to do this. The easiest option is probably that transmit ID is for every STA associated with any BSS in the multiple BSSID set. For each BSS in the multiple BSSID set, transmit ID plus multiple BSSID index of the BSS plus 1 is the ID to indicate broadcast address for specific BSS in the multiple BSSID set. | Revised –Agree in principle with the comment. Proposed resolution clarifies that the transmitter ID identifies the AP corresponding to the transmitted BSSID when dot11MBSSIDActivated is true, and another set of identifiers (nontransmitter ID) identify the nontransmitted BSSID, which is inline with the proposed change. For more details please refer to:<https://mentor.ieee.org/802.11/dcn/18/11-18-0514-02-00ba-addressing-in-wur-frames.pptx> TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 826. |
| 827 | Po-Kai Huang | 50.30 | When the WUR AP is in a multiple BSSID set, we need to make sure that WID is unique with BSSs of the multiple BSSID set. | As in comment. | Revised –Agree in principle with the comment. This is an issue when the AP randomly selects the WUR IDs, since the AP that calculates the WUR ID from the AID of the PCR of the STA already ensures that this is the case (please refer to 9.4.2.5 (TIM element)).TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 827. |
| 854 | Po-Kai Huang | 50.30 | Change WUR STA to WUR non-AP STA in 31.3.4 | As in comment. | AcceptedNote to TGba editor: No further changes are needed since it is already accounted for in D1.1 of TGba. |
| 863 | Pooya Monajemi | 49.57 | Draft needs to address multi-BSSID APs. | Indicate if the transmitted BSSID is used in this context for a multi-BSSID AP. | Revised –Agree in principle with the comment. Proposed resolution clarifies that the transmitter ID identifies the transmitted BSSID when dot11MBSSIDActivated is true.TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 863. |
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| 1126 | Xiaofei Wang | 50.31 | The WUR ID selection should be left for implementation similar to AID selections. | remove "The AP shall either select the WUR ID randomly from the identifier's space or calculate the WUR ID as AID + transmit ID, where the AID is the association identifier of the STA, the transmit ID is defined in 31.3.2 (Transmit ID) and the addition performed between the two identifiers is circular modulo 212." | Rejected –The comment fails to identify a technical issue. Selection of AIDs is not left to implementation but rather follows strict rules to ensure uniqueness of the AID assignment and noncollision with BSS AIDs when multiple bssid operation is enabled. For the WUR case it is also essential to ensure that the likelihood of non-collision between IDs selected from APs in the same area is minimal, which is what these rules are specifying. |
| 131 | Alfred Asterjadhi | 57.05 | It is unclear which of the group-addressed BUs are being indicated as available when the AP has setup a multi-BSS. Please clarify. Similar consideration for the critical update behavior. | As in comment. | Revised –Agree in principle with the comment. Proposed resolution clarifies that the availability of the BUs is for the transmitting BSSID when the ID contains the transmitter ID and for the corresponding nontransmitted BSSID when the ID contains a nontransmitter ID. To enable this procedure a new normative behavior subclause is added to the draft which provides the same procedure as baseline AID computation for the BSS AIDs based on their indexing in the TIM element. This concept was discussed in detail in the following slide deck: <https://mentor.ieee.org/802.11/dcn/18/11-18-0514-02-00ba-addressing-in-wur-frames.pptx>. TGba editor to make the changes shown in 11-18/2162r4 under all headings that include CID 131. |

**Discussion: *None.***

* ID field

**TGba Editor: *Change the table below of this subclause as follows (#CID 91, 99, 826, 131):***

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| --- |
| * Identifiers of WUR frames
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| ID field  | Identifier description |
| Transmitter ID | Identifier of the transmitting AP (see 31.3.2 (Transmitter ID)) |
| Nontransmitter ID | Identifier of the nontransmitted BSSID (see 31.3.5 (Nontransmitter ID) *(#91, 99, 826, 131)* |
| Group ID | Identifier of a group of receiving WUR non-AP STAs (see 31.3.3 (Group ID)) |
| WUR ID | Identifier of an individual receiving WUR non-AP STA (see 31.3.4 (WUR ID)) |
| OUI1 | The 12 LSBs of the OUI (see 9.4.1.31 (Organization Identifier field))(#849) |

* WUR Wake-up frame format

**TGba Editor: *Change the paragraph below as follows (#CID 91, 99, 826, 131):***

The ID field of the WUR Wake-up frame is set to

* The WUR ID when the frame is individually addressed to a WUR non-AP STA
* The group ID when the frame is group addressed to one or more WUR non-AP STAs
* The transmitter ID when the frame is broadcast addressed to all WUR non-AP STAs that are associated with the WUR AP, with the AP corresponding to the transmitted BSSID when dot11MultiBSSIDImplemented is true
* The nontransmitter ID when the frame is broadcast addressed to all WUR non-AP STAs that are associated with the WUR AP corresponding to that nontransmitted BSSID when dot11MultiBSSIDImplemented is true
* 0 when multiple WUR IDs are included in the Frame Body field of the frame*(#91, 99, 826, 131)*

**TGba Editor: *Change the paragraph below of this subclause as follows (#CID 91, 131):***

The Group Addressed BU subfield is set to 1 to indicate that one or more group addressed frames are buffered at the AP corresponding to the BSSID indicated in the ID field.. Otherwise, the Group Addressed BU subfield is set to 0.*(#91, 131)*

* Setting the identifiers of WUR frames
* General
* **TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 620):***

The ID field of WUR frames contains an identifier (ID) that is selected from the identifier’s space, which consists of all integer values between 0 and 4095. A WUR AP ensures that each identifier is either a transmitter ID (see 31.3.2 (Transmitter ID)), a group ID (see 31.3.3 (Group ID)), a WUR ID (see 31.3.4 (WUR ID)), or nontransmitter ID (see 31.3.5 (Nontransmitter ID)).*(#620)*

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 98, 825, 863):***

The compressed BSSID is equal to the 32-bit CRC calculated over the BSSID contained in Beacon frames transmitted by the WUR AP (calculation is performed as defined in 9.2.4.8 (FCS field) where the BSSID is the *calculation fields*).

NOTE—The BSSID is the transmitted BSSID when dot11MultiBSSIDImplemented is true (see 11.1.3.8) *(#98, 825, 863)*

* Transmitter ID

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 99, 826, 863):***

A transmitter ID identifies the WUR AP transmitting the WUR frame. A WUR frame with transmitter ID in the ID field is a broadcast WUR frame that is addressed to all the WUR non-AP STAs that are associated with the WUR AP if dot11MultiBSSIDImplemented is false and that are associated to the transmitted BSSID if dot11MultiBSSIDImplemented is true.

NOTE—WUR non-AP STAs associated to a nontransmitted BSSID are identified by the nontransmitter ID (see 31.3.5(Nontransmitter ID). These STAs are expected to receive WUR Beacons, and WUR Discovery frames send with the transmitter ID. *(#99, 826, 863)*

* Group ID

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 827):***

The WUR AP shall randomly select the lowest group ID of the group ID space from the identifier’s space, which is not occupied by WUR IDs, transmitter ID, and nontransmitter IDs (if any).*(#827)*

* WUR ID

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 622):***

A WUR ID identifies the WUR non-AP STA that is the intended recipient of the WUR frame. A WUR frame with a WUR ID in the ID field is an individually addressed WUR frame that is addressed to the WUR non-AP STA identified by that WUR ID.*(#622)*

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 827):***

A WUR AP shall assign to each WUR non-AP STA a WUR ID that uniquely identifies the WUR non-AP STA within the BSS of the WUR AP. The WUR AP shall either select the WUR ID randomly from the identifier’s space or calculate the WUR ID as *AID* + *transmitter ID*, where the *AID* is the association identifier of the STA, the *transmitter ID* is defined in 31.3.2 (Transmitter ID) and the addition performed between the two identifiers is circular modulo *212*. The WUR AP shall ensure that the selected or calculated WUR ID is not any of 0, any *Group ID,* *transmitter ID* of the WUR AP*,* or any *nontransmitter ID* (if any). An AP with dot11MultiBSSIDImplemented of true that selects the WUR IDs randomly shall ensure that the WUR IDs are unique across all BSSs of the multiple BSSID set. The WUR AP shall indicate the WUR ID assigned to a WUR non-AP STA in the WUR ID field of the WUR Mode element it sends to the STA.*(#827)*

**TGba Editor: *Insert a new subclause as follows (#CID 91, 99, 826, 131):***

**31.3.5 Nontransmitter ID**

A nontransmitter ID identifies a nontransmitted BSSID from the multiple BSSID set (see 11.1.3.8 Multiple BSSID procedure). A WUR Wake Up frame with nontransmitter ID in the ID field is a broadcast WUR Wake Up frame that is addressed to all the WUR STAs that are associated with the nontransmitted BSSID.

The WUR AP shall calculate a *nontransmitter ID* as *k* + *transmit ID*, where *k* is the value of the BSSID index field corresponding to that BSS (see 9.4.2.74 (Multiple BSSID-Index element) for a nontransmitted BSSID, the *transmit ID* is defined in 31.3.2 (Transmit ID), and the addition performed between the two identifiers is circular modulo 212.*(#91, 99, 826, 131)*