IEEE P802.11
Wireless LANs

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| CR for WUR frame format (part 1) |
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Abstract

This submission proposes resolutions for comments related to TGba D1.0 with the following CIDs (18 CIDs):

* 97, 102, 398, 400, 496, 527, 617, 618, 721, 722, 797, 798, 799, 1176, 1177, 1178, 1179, 1240

Revisions:

* Rev 0: Initial version of the document.

***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 TGax 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** |
| 617 | Mark RISON | 49.39 | "Each identifier can be a transmit ID, which is obtained from the compressed BSSID, group ID, or a WUR ID." -- it is not clear whether this is saying that the transmit ID is obtained from the compressed BSSID, GID or WURID; or whether this is saying that the identifier can be one of a transmit ID (obtained from compressed BSSID), GID or WURID" | If the former, split into two sentences. If the latter, put the "which" subclause in parentheses | REVISEDAgree in principleIt is only the transmit ID obtained from the compressed BSSID. The proposed resolution is to move the contentes related to the compressed BSSID to 31.3.2, in order to avoid confusion.TGba editor to make the changes shown in 11-18/1837r0 under all headings that include CID 617. |
| 400 | James Lepp | 49.44 | Already confused about the CRC here. Is it the CRC defined in 11ba, or the CRC defined in the base spec? |  | REJECTEDThe current text already clarifies that the CRC calculation follows the baseline spec with a reference. |
| 496 | Joseph Levy | 49.34 | There is no need to define the elements or fields of the WUR PPDU, as these are already defined in clause 9, clause 9 should be referenced here. A statement simply saying the format of the WUR PPDU is defined in 9.10 all that is necessary. Formats should not be specified more than once and should only be specified in clause 9. | Remove redundant WUR PPDU frame format information. | REVISED Agree in principle with the comment.Rules for Setting the Address field are already defined in 9.10.3 for all types of WUR frames.The purpose of this subclause is to define rules for assigning or calculating WUR identifiers.The proposed resolution is to delete all sentences related to frame format and add references for clause 9TGba editor to make the changes shown in 11-18/1837r0 under all headings that include CID 496. |
| 398 | James Lepp | 49.53 | ""A WUR frame with transmit ID in the Address field is a broadcast WUR frame"". This statement is true, but it isn't useful. It isn't the value of the Transmit ID field that indicates the frame is a broadcast frame." | Explain what in a WUR Frame indicates the 12 bit address field contains a transmit ID. Does this only apply if WUR frame type = 0, or is there another case? This isn't described anywhere. | REVISEDAgree in principle with the comment.Rules for Setting the Address field are already defined in 9.10.3 for all types of WUR frames. It is redundant to have another text that mentions the relationship between the Address field and the identifier in this subclause. The proposed resolution is to delete the cited text as well as the similar texts in 31.3.3 and 31.3.4TGba editor to make the changes shown in 11-18/1837r0 under all headings that include CID 398. |
| 527 | Lei Huang | 49.54 | WUR Discovery frame is a pre-association frame and also has transmit ID in the Address field. | Change "A WUR frame with transmit ID in the Address field is a broadcast WUR frame that is addressed to all the WUR STAs that are associated with the transmitting AP." to "A WUR Wake-up frame with transmit ID in the Address field is a broadcast WUR frame that is addressed to all the WUR STAs that are associated with the transmitting AP. A WUR Discovery frame with transmit ID in the Address field is a broadcast WUR frame that is addressed to all the WUR STAs that are not necessarily associated with the transmitting AP." | REJECTEDThe settings of the address fields of WUR frames are already defined in 9.10.3. No need to mention it in this subclause |
| 1240 | Yunsong Yang | 49.34 | In P43L35, identifier in the Address field is "0 when multiple WIDs are included in the Frame Body field of the frame". But in clause 31.3, there is no such description. | Please clarify. | REJECTEDThe settings of the address fields of WUR frames are already defined in 9.10.3. No need to mention it in this subclause |
| 618 | Mark RISON | 49.52 | "A WUR frame with transmit ID in the Address field is a broadcast WUR frame that is addressed to all the WUR STAs" -- this seems to be missing something" | Add "all-ones" before "transmit ID" | REJECTEDTransmit ID is a unique identifier of WUR AP. Since WUR frame has only one address field, the transmit ID is used for the value of the Address field of broadcast WUR frame.  |
| 721 | Minyoung Park | 49.4 | The following paragraph is not correct because the identifier value 0 has a special meaning (indicates multiple-WID WUR Wake-up frame) and cannnot be assigned as a transmitter ID, group ID, or WUR ID: "The Address field of WUR frames contains an identifier (ID) that is selected from the range 0 to 4095. Each identifier can be a transmit ID, which is obtained from the compressed BSSID (see 31.3.2 (Transmit ID)), group ID (see 31.3.3 (Group ID)), or a WUR ID (see 31.3.4 (WUR ID))."Please replace the paragraph above with the following:"The Address field of WUR frames contains an identifier (ID) that is selected from the range 0 to 4095. Each identifier can be a transmit ID, which is obtained from the compressed BSSID (see 31.3.2 (Transmit ID)), group ID (see 31.3.3 (Group ID)), or a WUR ID (see 31.3.4 (WUR ID)) except the identifier value of 0." | As shown in the comment. | REJECTED0 address value for VL WUR Wake-up frame continues to make exceptions throughout the draft.We propose to use the transmit ID instead of 0 for the Address value.In this case, no need to modify the text for this comment. |
| 102 | Alfred Asterjadhi | 50.43 | Specify what the Address field value is for a VL WUR Wake Up frame. | As in comment. | REJECTEDThe settings of the address fields of WUR frames are already defined in 9.10.3. No need to mention it in this subclause |
| 722 | Minyoung Park | 50.43 | The following sentence is not clear whether this applies to any WUR Wake-up frame: "A WUR AP that generates a WUR Wake-up frame that contains a Frame Body field with one or more STA Info fields shall order the STA Info fields so that the WUR IDs appear in increasing order. The AP shall not include the WUR ID of a WUR STA that does not support reception of VL WUR frames (see 9.4.2.274 (WUR Capabilities element))."Replace this paragraph as follows:"A WUR AP that generates a WUR Wake-up frame that contains a Frame Body field with one or more STA Info fields shall set the Address field to 0 and shall order the STA Info fields so that the WUR IDs appear in increasing order. The AP shall not include the WUR ID of a WUR STA that does not support reception of VL WUR frames (see 9.4.2.274 (WUR Capabilities element))." | As shown in the comment. | REVISEDAgree in principle with the comment.“A WUR Wake-up frame that contains a Frame Body field with one or more STA Info fields” is equivalent to a VL WUR Wake-up frame.In addition, the cited parahgraph describes the normative behavior of an WUR AP when it intends to generate a VL WUR Wake-up frame.The proposed resolution is to rephrase the text to specify “VL Wake-up frame”, and move the text to 31.7.2TGba editor to make the changes shown in 11-18/1837r0 under all headings that include CID 722. |
| 797 | Patrice Nezou | 49.57 | The transmit ID is built only from the 12 MSBs of the compressed BSSID. In a dense environment, some APs may have the same transmit ID. | Please define a procedure to detect the usage of the same Transmit ID by multiple APs or other mechanism to assign a unique transmit ID to each AP. | REJECTEDThe chance of having duplicated transmit ID is extremely low (~0.0002). In case of duplication, WUR STA still can check the validity of a received WUR frame using the hidden BSSID information preventing false wake-up.Moreover, changing the transmit ID requires all WUR STAs in WUR Mode to wake-up, also affects WUR identifier assignment.The proposed resolution is not to define additional procedure for this comment, considering the complexity and the limited. |
| 798 | Patrice Nezou | 49.57 | The transmit ID is built only from the 12 MSBs of the compressed BSSID. In a dense environment, some APs may have the same transmit ID. | Please define a procedure at the non-AP STA side to warn the AP that its transmit ID is already in use by another AP. | REJECTEDThe chance of having duplicated transmit ID is extremely low (~0.0002). In case of duplication, WUR STA still can check the validity of a received WUR frame using the hidden BSSID information preventing false wake-up.Moreover, changing the transmit ID requires all WUR STAs in WUR Mode to wake-up, also affects WUR identifier assignment.The proposed resolution is not to define additional procedure for this comment, considering the complexity and the limited usage. |
| 799 | Patrice Nezou | 50.3 | "WUR AP shall assign to each WUR STA a WUR ID that uniquely identifies the WUR STA within the BSS of the AP. 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."  The AID of a STA and the transmit ID of an AP are not unique. So there may be some overlappings that create collisions and wake up WUR STAs for nothing. | please define a procedure to reallocate a WUR ID to a WUR STA if some collisions are detected | REJECTEDAs the range of the identifier space is 0 to 4095, WUR ID collision is unavoidable. If we allow STAs to report collision and request reassignment, STAs might wake-up and report collision via PCR repeatedly that might dominate the power consumption of the STAs. Even with duplicated WUR ID, STA can still check the validity of a received WUR frame using the hidden BSSID information preventing false wake-up.The proposed resolution is not to define an additional procedure for this comment, considering the complexity and the limited usage. |
| 1176 | yujin noh | 50.25 | WUR frame and WUR PPDU are mixed in use. If needed, fix it to be consistent through the spec. | as in comment | REJECTEDWUR frame is a MAC layer frame without WUR-SYNC field. No change is required for this comment |
| 1177 | yujin noh | 50.22 | Clarify WID and WUR ID properly with when or how to use. Taking a look at the spec, currently WUR ID identifies the WUR STA while WID identifies WUR non-AP STA. Make sure whether it is intentional. In this way, WID is part of WUR ID or the same. If needed, WUR STA could be classified to WUR non-AP STA further in this subclause | as in comment | REVISEDAgree in principle with the comment.Already covered by the proposed resolution of CID 1073 and 1077 in 11-18/1847r1No change is required for this comment.  |
| 1178 | yujin noh | 50.22 | WUR AP and AP are minxed in use in 31.3.4. fix it to be consistent | as in comment | REJECTEDIn every paragraph within 31.3.4, the occasions of ‘AP’ without prefix are clearly referred by WUR AP in the previous text. It is redundant to add prefix for every occasion. |
| 1179 | yujin noh | 50.22 | WUR STA and STA are minxed in use in 31.3.4. fix it to be consistent | as in comment | REJECTEDIn every paragraph within 31.3.4, the occasions of ‘STA’ without prefix are clearly referred by WUR STA in the previous text. It is redundant to add prefix for every occasion. |

**Discussion:**

* Setting the identifiers of WUR frames
* General

**TGba Editor: *make the following changes of this clause***

A WUR frame contains one or more identifiers (ID) each of which is selected from the range 0 to 4095 (see 9.10.2.2 (Address field) and 9.10.3.2 (WUR Wake-up frame format)). *(#496)* Each identifier can be a transmit ID, *(#617)* (see 31.3.2 (Transmit ID)), group ID (see 31.3.3 (Group ID)), a WUR ID (see 31.3.4 (WUR ID)), or the 12 LSB of the OUI (see 9.4.1.31 (Organization Identifier field)). *(#97)*

**TGba Editor: *delete the following paragraph of this clause***

 *(#617)*

* Transmit ID

**TGba Editor: *make the following changes of this clause***

A transmit ID identifies the AP transmitting the WUR frame. *(#398, 496)*

A WUR AP shall use the 12 MSBs of the compressed BSSID as the transmit ID of WUR frames it transmits. 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*). *(#617)*

* Group ID

**TGba Editor: *make the following changes of this clause***

A group ID identifies a group of one or more WUR STAs and is selected from a group ID space, obtained from the identifier’s space. *(#398, 496)*

* WUR ID

**TGba Editor: *make the following changes of this clause***

A wake-up radio (WUR) ID identifies the WUR STA that is the intended recipient of the WUR frame. *(#398, 496)*

**TGba Editor: *delete the following paragraph of this clause***

 *(#722)*

* Wake-up Operation
* AP Operation

**TGba Editor: *add the following paragraph after the note of the second paragraph in this clause***

A WUR AP that generates a VL WUR Wake-up frame shall order the STA Info fields so that the WUR IDs appear in increasing order. The AP shall not include the WUR ID of a WUR STA that does not support reception of VL WUR frames. (see 9.4.2.274 (WUR Capabilities element)). *(#722)*