802.11ba Draft Specification

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| 11ba MAC Comment Resolution on WUR Wake-up frame |
| Date: 2019-03-11 |
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Abstract

This submission proposes resolution for the CID 2162.

Revision History:

* Rev 0: Initial version of the document

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 D1.0 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 or insert 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** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2162 | 58.38 | 9.10.3.2 | When dot11MultiBSSIDImplemented is true, in ID field of FL WUR Wake-up frame, the transmitter ID is contained to indicates all WUR STAs that are associated with the AP corresponding to the transmitted BSSID and the nontransmitter ID is contained to indicates all WUR STAs that are associated with the AP corresponding to the nontransmitted BSSID. When AP wants to wake up all WUR STAs that are associated with transmitted BSS as well as all WUR STAs that are associated with nontransmitted BSSs (i.e., all WUR STA associated with all its BSS), AP should send different WUR Wake-up frame on each BSS. We can simply solve it by defining a ID (e.g., transmitter ID -1) to indicates all WUR STAs on all its BSSs for an AP with dot11MultiBSSIDImplemented equal to true. This is similar to approach at STA\_ID\_LIST of 11ax (26.11.1 STA\_ID\_LIST). | Define the new ID (e.g., transmitter ID - 1) to indicates all WUR STAs on all its BSSs for an AP with dot11MultiBSSIDImplemented equal to true and describe the texts related to the wake up operation. | Revised – Agree in principle with the commenter. A rule to indicate all WUR STAs on all its BSSs for an AP with dot11MultiBSSIDImplemented should be defined for more efficient WUR frame transmission, especially in dense WLAN network, which can reduce the duplicated transmissions of the broadcast Wake-Up frames that are sent by using lowest data rate. TGba editor, please make changes as shown in doc 11-19/0443r3 under all headings that include CID 2162. |

***TGba Editor: Modify the Figure 9-772c (WUR Capabilities Information field format) as follows:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B7 | B8 | B9 B10 | B11 | B12 | B13 | B14 | ~~B14~~ B15 |
|  | Transition Delay | VL WUR frame Support | WUR Group IDs Support | Protected WUR Frame Support | 20MHz WUR PPDU with HDR Support | WUR FDMA Channel Switching Support | All-BSSs ID Support | Reserved |
| Bits | 8 | 1 | 2 | 1 | 1 | 1 | 1 | 1~~2~~ |

**Figure 9-772c- WUR Capabilities Information field format**

***TGba Editor: Add the following row at the end of the Table 9-321a(Subfields of the WUR Capabilities Information field)***

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| All BSSs ID Support | Indicates support for transmission of the broadcast WUR Wake-up frame with the All BSSs ID in the ID field | Reserved for a WUR STAFor a WUR AP:* Set to 1 to indicate support for the transmission of broadcast WUR Wake-up frame with the all-BSSs ID. In this case, the transmitter ID – 1 is used as all-BSSs ID
* Set to 0 otherwise.

When dot11MultiBSSIDImplemented is false, this field is set to 0. |

**TGba Editor: *Insert the definitions below (maintaining alphabetical order) as follows (#CID 2141, 2142):***

**all-BSSs identifier (ID):** A identifier used by a wake-up radio (WUR) access point (AP) to identify broadcast addressed WUR frames that are addressed to all WUR non-AP stations (STAs) associated with any AP which is a member of the multiple BSSID set when multiple BSSID operation is supported.*(#2142, 2402)*

***TGba Editor: Modify the table 9-540b (Identifiers of WUR frames) as follows:***

Table 9-540b—Identifiers of WUR frames

|  |  |
| --- | --- |
| ID field  | Identifier description |
|

|  |
| --- |
| Transmitter ID |

 | Identifier of the transmitting AP (see 30.4.2 (Transmitter ID)) |
|

|  |
| --- |
| Nontransmitter ID |

 | Identifier of the nontransmitted BSSID (see 30.4.5 (Nontransmitter ID)) |
|

|  |
| --- |
| All-BSSs ID (#2162) |

 | Identifier of all BSSs within the multiple BSSID set (see 30.4.6 (All-BSSs ID)) |
|

|  |
| --- |
| WUR Group ID |

 | Identifier of a group of receiving WUR non- AP STAs (see 30.4.3 (WUR Group ID)) |
|

|  |
| --- |
| WUR ID |

 | Identifier of an individual receiving WUR non-AP STA (see 30.4.4 (WUR ID)) |
|

|  |
| --- |
| OUI1  |

 | The 12 LSBs of the OUI (see 9.4.1.31 (Organization Identifier field)) |

***TGba Editor: Modify the text of subclause 9.10.3.2 (WUR Wake-up frame format) as follows:***

**9.10.3.2 WUR Wake-up frame format**

The frame format of the WUR Wake-up frame is as defined in Figure 9-988a (WUR frame format).

The Frame Control field is as defined in 9.10.2.1.1 (Frame Control field), with the Length Present subfield set to 1 if the Frame Body field is present and the Length Present subfield set to 0 otherwise.

The ID field of the FL WUR Wake-up frame contains one of the following:

—The WUR ID when the frame is individually addressed to a WUR non-AP STA

—The WUR 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

—The all-BSSs ID when the frame is broadcast addressed to all WUR non-AP STAs that are associated with any WUR AP that is a member of the multiple BSSID set when dot11MultiBSSI­DImplemented is true and when the Protected subfield is set to 0, and when the all-BSSs ID Support subfield of the WUR Capabilities Information field is set to 1. (#2162)

The ID field of the VL WUR Wake-up frame contains a WUR group ID (see 30.4.3 (WUR Group ID)).

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***TGba Editor: Modify the text of subclause 30.4.1 (General) as follows:***

**30.4 Setting the identifiers of WUR frames**

**30.4.1 General**

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 (see 9.10.2.2 (ID field)). A WUR AP ensures that each identifier is either a transmitter ID (see 30.4.2 (Transmitter ID)), a WUR group ID (see 30.4.3 (WUR Group ID)), a WUR ID (see 30.4.4 (WUR ID)), a nontransmitter ID (see 30.4.5 (Nontransmitter ID)), an all-BSSs ID (see 30.4.6 (All-BSSs ID)), (#2162) or a portion of the OUI (see 9.10.3.4 (WUR Vendor Specific frame format)).

***TGba Editor: Modify the text of subclause 30.4.3 (WUR Group ID) as follows:***

**30.4.3 WUR Group ID**

A WUR group ID identifies a group of one or more WUR non-AP STAs and is selected from a WUR group ID space which is a subset of consecutive values obtained from the identifier’s space. A FL WUR Wake-up frame with WUR group ID in the ID field is defined as a group addressed WUR frame that is addressed to all the WUR non-AP STAs identified by that WUR group ID. A VL WUR Wake-up frame with WUR group ID in the ID field is a group addressed WUR frame that is addressed to all the WUR non-AP STAs identified by the WUR IDs included in the Frame Body field.

The WUR AP shall randomly select the lowest WUR group ID of the WUR group ID space from the identifier’s space and shall ensure that none of the WUR group IDs coincide with any of the WUR IDs, transmitter ID, all-BSSs ID (if any), (#2162) and nontransmitter IDs (if any).

…

***TGba Editor: Modify the text of subclause 30.4.4 (WUR ID) as follows:***

**30.4.4 WUR ID**

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 defined as an individually addressed WUR frame that is addressed to the WUR non-AP STA identified by that WUR ID.

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 30.4.2 (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 *WUR Group ID,* the *transmitter ID* of the WUR AP, the all-BSSs ID (if any), (#2162) or any nontransmitter ID (if any). An AP with dot11MultiBSSIDImplemented equal to 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.

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***TGba Editor: Insert the following subclause 30.4.6 (All-BSSs ID) at the end of subclause 30.4.5 (Nontransmitter ID):***

* + 1. All-BSSs ID(#2162)

An all-BSSs ID identifies all BSSs corresponding to all BSSIDs (i.e., a transmitted BSSID and all nontransmitted BSSIDs) within the multiple BSSID set (see 11.1.3.8 Multiple BSSID procedure).

A WUR Wake-up frame is a broadcast addressed WUR Wake up frame if the WUR Wake-up frame has all-BSSs ID in the ID field. The WUR Wake up frame is addressed to all the WUR non-AP STAs that are associated with any WUR AP that is a member of the multiple BSSID set when the Protected subfield of the WUR Wake-up frame is set to 0 and the all-BSSs ID Support subfield of the WUR Capabilities Information field is set to 1.

The WUR AP that sets the all-BSSs ID Support subfield of the WUR Capabilities Information field to 1 and a WUR non-AP STA that receives the all-BSSs ID Support subfield set to 1 shall calculate the *all-BSSs ID* as *transmitter ID-1*, where the *transmitter ID* is defined in 30.4.2 (Transmitter ID), and the subtraction is circular modulo 212.

A WUR AP may send a broadcast addressed WUR Wake-up frame containing the all-BSSs ID in ID field when the all-BSSs ID Support subfield of the WUR Capabilities Information field sent by the AP is set to 1.