IEEE P802.11
Wireless LANs

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| Comment resolutions for miscellaneous comments |
| Date: 2019-04-10 |
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Abstract

This submission proposes resolutions for multiple comments related to TGba D2.0 with the following CIDs (8 CIDs):

* 2141, 2142, 2181, 2506, 2814, 2101, 2402, 2770

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Contains feedback received via e-mail from Rojan, Po-Kai, and Kaiying. Changes 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 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** |
| 2141 | James Lepp | 19.04 | add compressed BSSID to the definitions in section 3.2 | add compressed BSSID to the definitions in section 3.2 | Revised –Agree in principle with the comment. Proposed resolution adds the definition for the compressed BSSID as non-unique identifier for a WUR BSS that is obtained from calculating the 32 bit CRC over the BSSID contained in Beacon frames transmitted by AP (inline with its use in 30.4.1).TGba editor to make the changes shown in 11-19/0580r1 under all headings that include CID 2141. |
| 2142 | James Lepp | 19.04 | add transmitter ID and nontransmitter ID to the definitions in section 3.2 | add transmitter ID and nontransmitter ID to the definitions in section 3.2 | Revised –Agree in principle with the comment. Proposed resolution adds the definition for transmitter ID and for nontransmitter ID (inline with their uses in 30.4.2 and 30.4.5).TGba editor to make the changes shown in 11-19/0580r1 under all headings that include CID 2142. |
| 2181 | Joseph Levy | 19.56 | FL is only used 4 times in the body of the WUR amendment (the first time defines FL) and 4 times in 4.3.15a. This limited usage of the abbreviation does not seem to make it worth while. Therefore delete the abbreviation in the abbreviation list and throughout the document. | Delete: "FL fixed-length" from 3.4 and throughout the rest of the amendment replace FL with fixed length. | Revised –Based on a quick search for the term “FL”, a total of 8 occurrences were identified (i.e., their usage is growing as comments are being addressed to improve the quality of the draft). The use of acronyms is beneficial to avoid using the long version of a term. Proposed resolution is to keep it and use consistently inline with the philosophy of acronyms. However, to address CID 2506 which is concerned about the impact of these acronyms in the baseline, the proposed resolution is to add the definition as (FL WUR) rather than simply FL.TGba editor to make the changes shown in 11-19/0580r1 under all headings that include CID 2181. |
| 2506 | Osama Aboulmagd | 19.65 | The use of the abbreviations "FL" and "VL". I am not sure why start using these them. Do you know how many changes in the baseline will be triggered by this use? There are 58 occurrences of "variable length" in the baseline. I suggest going back to use "fixed-length" and "Variable-length" instead of FL and VL. | as in comment | Revised –The use of acronyms is recommended for terms that are frequently used in a draft. Regarding the question the comment seems to already answer it. Proposed resolution is to keep the acronyms, due to their inherent benefits, and narrow them down to WUR case only so that they do not impact baseline use of these terminologies. TGba editor to make the changes shown in 11-19/0580r1 under all headings that include CID 2506. |
| 2814 | Yunsong Yang | 62.01 | Since BIP is used for protecting WUR frames, clause 12.5.4 should be updated accordingly. | Add the following sentence to the end of the first sentence under 12.5.4.1 BIP overview: "BIP also provides integrity and replay protection for individually addressed and group addressed WUR frames (see 30.9 (Protected WUR frames))." | Accepted |
| 2101 | Carl Kain | 44.41 | What do you mean by separate? Do you mean different for each reciever? | Please clarify. | Revised –Agree in principle with the comment that the term separate is ambiguous. Proposed resolution replaces it with “independent” to indicate that the IPNs for different recipients are independent. TGba editor to make the changes shown in 11-19/0580r1 under all headings that include CID 2101. |
| 2402 | Mark RISON |  | "broadcast addressed" is not a defined term (only group and individually addressed) | Delete "broadcast" in 9.10.3.2 (first two). Delete "addressed" in "broadcast addressed" in 9.10.3.2 (next three) | Revised –Agree in principle that the term broadcast addressed is not explicitly defined. However, removing the term brings ambiguity since broadcast in general is a subcase of group addressed, but in 11ba broadcast traffic reception is mandatory and group addressed traffic reception is optional. Hence proposed resolution is to add the definition for broadcast addtessed when defining transmitter ID, and non-transmitter ID in clause 3.2 so that it is clear what “broadcast addressed” means.TGba editor to make the changes shown in 11-19/0580r1 under all headings that include CID 2402. |
| 2770 | Yonggang Fang | 44.43 | What is IPN? Need to define the term in 3.2 | Please clarify | Rejected –The commenter is asking a question. IPN is defined as IGTK packet number in subclause 3.2 of baseline (REVmd D2.0). Since it is already defined in the baseline no further action is required for this comment. |

**Discussion: *None.***

* Definitions, acronyms, and abbreviations
* Definitions specific to IEEE Std 802.11

Insert the following definitions maintaining alphabetical order:

**multicarrier on-off keying (MC-OOK) symbol:** A MC-OOK symbol can be either an On symbol where the multicarrier signal is present or an Off symbol where the multicarrier signal is not present.

**wake-up radio (WUR) access point (AP):** An access point (AP)that is a non-high-throughput (non-HT), high-throughput (HT), very high throughput (VHT), or high efficiency (HE) AP that is capable of transmitting a WUR physical layer (PHY) protocol data unit (PPDU) and supports the WUR operation.

**wake-up radio (WUR) channel:** A channel in which a WUR access point (AP) transmits WUR frames and a WUR non-AP station (STA) listens.

**wake-up radio (WUR) discovery channel:** The channel used by a WUR access point (AP) to transmit WUR Discovery frames.(#2701)

**wake-up radio (WUR) frequency division multiple access (FDMA) physical layer (PHY) protocol data unit (PPDU):** A PPDU transmitted with the TXVECTOR parameter FORMAT equal to WUR\_FDMA and TXVECTOR parameter CH\_BANDWIDTH equal to WUR\_CBW\_40 or WUR\_CBW\_80 or WUR\_CBW\_PUNC80-PRI or WUR\_CBW\_PUNC80-SEC.(#2372, #2237, #2502)

**wake-up radio (WUR) 80 MHz channel:** The 80 MHz channel that is used to transmit 80 MHz WUR Frequency Division Multiple Access (FDMA) physical layer (PHY) protocol data units (PPDUs).

**wake-up radio (WUR) mode:** A negotiation status between a WUR AP and a WUR non-AP STA such that the WUR non-AP STA alternates between the WUR awake state and the WUR doze state when the WUR non-AP STA is in the doze state.

**wake-up radio (WUR) non-access point (non-AP) station (STA):** A WUR non-AP STA is a non-high-throughput (non-HT), high-throughput (HT), very high throughput (VHT), or high efficiency (HE) non-AP STA that is capable of receiving a WUR physical layer (PHY) protocol data unit (PPDU) and supports the WUR operation.(#2177,#2179)

**wake-up radio (WUR) physical layer (PHY) protocol data unit (PPDU):** A PPDU transmitted with the TXVECTOR parameter FORMAT equal to WUR and TXVECTOR parameter CH\_BANDWIDTH equal to WUR\_CBW\_20.

**wake-up radio (WUR) primary channel:** The channel used by a WUR access point (AP) to transmit WUR Beacon frames.

NOTE—WUR primary channel can be different from the primary channel of the BSS.

**wake-up radio (WUR) primary 40 MHz channel:** The 40 MHz channel that is used to transmit 40 MHz WUR Frequency Division Multiple Access (FDMA) physical layer (PHY) protocol data units (PPDUs).

**wake-up radio (WUR) scanning:** The process of scanning WUR discovery channels for WUR Discovery frames. (#2514)

**wake-up radio (WUR) secondary channel:** The 20 MHz channel adjacent to the WUR primary channel that together form the WUR primary 40 MHz channel.

**wake-up radio (WUR) secondary 40 MHz channel:** The 40 MHz channel adjacent to the WUR primary 40 MHz channel that together form the WUR 80 MHz channel.

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

**compressed basic service set identifier (BSSID):** An identifier for a wake-up radio (WUR) basic service set (BSS) that is obtained from calculating the 32-bit cyclic redundancy check (CRC) over the BSSID contained in Beacon frames transmitted by the WUR access point (AP).*(#2141)*

**transmitter identifier (ID):** An 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 the WUR AP when multiple BSSID operation is not supported or that are addressed to all WUR non-AP STAs associated with the transmitted basic service set identifier of a multiple BSSID set when multiple BSSID operation is supported or that are addressed to all WUR non-AP STAs that intend to discover or synchronize with the WUR AP.*(#2142, 2402)*

**nontransmitter identifier (ID):** An 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 the corresponding nontransmitted basic service set identifier (BSSID) from the multiple BSSID set when multiple BSSID operation is supported.*(#2142, 2402)*

* Abbreviations and acronyms

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 2181, 2506):***

FDMA frequency division multiple access

FL WUR fixed-length wake up radio*(#2181, 2506)*

HDR high data rate

LDR low data rate

MC-OOK multicarrier on-off keying

OOK on-off keying

PPN partial packet number

SGID starting WUR group identifier

TWBTT target WUR beacon transmission time

VL WUR variable-length wake up radio*(#2506)*

WUR wake-up radio

WUR ID wake-up radio identifier

WUR IGTK wake-up radio integrity group temporal key

WUR TK wake-up radio temporal key

* WUR Operation element

The WUR Operation element contains the set of parameters necessary to support the WUR operation. The format of the WUR Operation element is defined in Figure 9-772d (WUR Operation element format).

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| --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | WUR Operation Parameters |
| Octets: | 1 | 1 | 1 | 10 |
| * WUR Operation element format
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The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The format of the WUR Operation Parameters field is defined in 9-772e (WUR Operation Parameters).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0        B7 | B8          B23 | B24   B31 | B32 B39 | B40 B55 | B56  B71 | B72 B75 | B76 | B77 B79 |
|  | Minimum Wake-up Duration | Duty Cycle Period Units | WUR Operating Class | WUR Channel | WUR Beacon Period | Offset of **Offset of Target Wake-up radio Beacon Transmission Time (TWBTT)**TWBTT | Counter | Common IPN | Reserved |
| Bits: | 8 | 16 | 8 | 8 | 16 | 16 | 4 | 1 | 3 |

* WUR Operation Parameters

The Minimum Wake-up Duration subfield indicates the minimum on duration of the WUR duty cycle operation (see 30.6 (WUR duty cycle operation)) in units of 256 µs.

The Duty Cycle Period Units subfield indicates the basic unit of the period of the WUR duty cycle operation (see 30.6 (WUR duty cycle operation)) in the unit of 4 µs.

The granularity of the Duty Cycle Period Units field is 4 .

The WUR Operating Class subfield indicates the operating class values as defined in Annex E in use for transmission of WUR Beacon frames from the WUR AP to the WUR non-AP STA. The operating class is interpreted in the context of the country specified in the Beacon frame. The encoding is the same as the definition of Operating Class field in 9.4.1.22 (Operating Class and Channel field).

The WUR Channel subfield indicates a channel number, which is interpreted in the context of the indicated operating class as defined in Annex E in use for transmission of WUR Beacon frames from the WUR AP to the WUR non-AP STA. The encoding is the same as the definition of Channel field in 9.4.1.22 (Operating Class and Channel field).

The WUR Beacon Period subfield represents the number of time units (TUs) between consecutive target WUR beacon transmission times (TWBTTs) (see 30.5.2 (WUR Beacon generation)).

The Offset of TWBTT subfield indicates the time difference between the TWBTT with the smallest TSF time in units of TU and TSF 0 (see 30.5.2 (WUR Beacon generation)).

The Counter subfield indicates the current value of the Counter subfield included in the broadcast WUR Wake-up frames (see 30.4.2 (Transmitter ID)).

**TGba Editor: *Change the paragraphs below of this subclause as follows (#CID 2101):***

The Common IPN subfield indicates if a common IPN is used for all protected WUR frames generated within the BSS. The Common IPN subfield is set to 1 to indicate that a common IPN is used for all protected WUR frames and is set to 0 to indicate that independent IPNs are used for protected WUR frames addressed to different receivers (see 30.9.3 (Generation and construction of IPN for WUR frames)). *(#2101)*