IEEE P802.11
Wireless LANs

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| Comment resolutions for CID 3012 |
| Date: 2019-08-12 |
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Abstract

This submission proposes resolutions for multiple comments related to TGba D3.0 with the following CIDs (1 CIDs):

* 3012

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised version that accounts for suggestions received from Rojan and Yunsong. Changes in green.
* Rev 2: Revised version that accounts for suggestions received during the conf call presentation. 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** |
| 3012 | Alfred Asterjadhi | 118.01 | Issues identified by CID 2055 were partially addressed. For example it is still not clear what WUR frame the AP generates within the SP if the AP does not have any DL BUs to be sent to the STA. Please explicitly state the requirement for both cases (Yes DL BUs available and No DL BUs available keeping in mind that the STAs need some certainty that they are in range with the AP). | As in comment | Revised –Agree in principle with the comment. Proposed resolution adds an explicit request from the STA to the AP during WUR Mode setup to indicate to the AP to generate keep alive WUR frames. An AP that receives such request shall schedule for transmission WUR Beacon frames during an on duration during which the AP does not send a WUR Wake Up frame for the STA. If the STA (that requested to be operating in this mode) does not receive any WUR frame during the scheduled on durations can determine with certainty that it will always be in range with the AP every on duration, independently of the AP having DL BUs or not for the STA. TGba editor to make the changes shown in 11-19/1433r2 under all headings that include CID 3012. |

**Discussion: *None.***

**TGba Editor: *Replace “Recommended WUR Parameters” with “Proposed WUR Parameters” throughout the draft (#CID 3012).***

* WUR Mode element

**TGba Editor: *Change the figure below of this subclause as follows (#CID 3012):***WUR AP indicates the start time of one WUR duty cycle schedule in the Starting time of the WUR duty cycle subfield of the WUR Parameters field in WUR Mode element.

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| * WUR Mode Response Status Definition
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| Value | Meaning |
| 0 | Accept. |
| 1 | Denied. Due to unspecified reason.  |
| 2 | Denied. The preferred duty cycle period is too large.  |
| 3 | Denied. Cannot satisfy the request of generating keep alive frames every on duration. |
| 4-255 | Reserved |

**TGba Editor: *Change the figure below of this subclause as follows (#CID 3012):***WUR AP indicates the start time of one WUR duty cycle schedule in the Starting time of the WUR duty cycle subfield of the WUR Parameters field in WUR Mode element.

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|  | B0            B1 | B2                   B4 | B5 | B6        B7 |
|  | Recommended WUR Wake-up Frame Rate | Recommended WUR Channel Offset | Requested Keep Alive Frame | Reserved |
| Bits | 2 | 3 | 1 | 2 |
| * Proposed WUR Parameters subfield format*(#3102)*
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**TGba Editor: *Insert the paragraph below at the end of this subclause (#CID 3012):***

The Requested Keep Alive Frame field is set to 1 if the WUR non-AP STA requests the WUR AP to transmit at a keep-alive WUR frame during the on durations that are negotiated with the STA. Otherwise, it is set to 0. *(#3102)*

29.6 Maintaining synchronization

29.6.1 General

**TGba Editor: *Change the paragraph below of this subclause as follows (#CID 3012):***WUR AP indicates the start time of one WUR duty cycle schedule in the Starting time of the WUR duty cycle subfield of the WUR Parameters field in WUR Mode element.

A WUR non-AP STA that is in WUR mode expects to receive WUR Beacon frames every dot11WURBeaconPeriod and expects to receive WUR Beacon frames within on durations negotiated with the WUR AP if the WUR AP has accepted to transmit keep-alive WUR frames (see 29.8.2 (WUR mode setup)).*(#3102)*

NOTE—A WUR STA’s TSF timer has the same TSF timer accuracy requirement, which is accurate to within ±100 ppm, defined in 11.1.3.9 (TSF timer accuracy) for a non-DMG STA.

If a WUR non-AP STA, which is in WUR mode and doze state, does not receive WUR Beacon frames for a time period, the WUR non-AP STA should perform WUR scanning (see 29.12 (WUR Discovery)) or transi­tion to awake state. The methods by which the WUR non-AP STA determines the exact value of the time period are implementation specific and out of scope of this standard.

NOTE—If a WUR non-AP STA does not perform any action while not receiving WUR Beacon frames for a long period of time, the WUR non-AP STA might not discover that it is already out of range of the WUR AP sending the WUR Bea­con frames.(#3029)

* WUR Beacon generation

**TGba Editor: *Change the paragraph below of this subclause as follows (#CID 3012):***WUR AP indicates the start time of one WUR duty cycle schedule in the Starting time of the WUR duty cycle subfield of the WUR Parameters field in WUR Mode element.

The WUR AP shall define the timing for the WUR operations by transmitting WUR Beacon frames according to dot11WURBeaconPeriod and the Offset of TWBTT subfield of the WUR Operation element that the WUR AP transmits. This defines a series of target WUR beacon transmission times exactly dot11WURBeaconPeriod TUs apart. Additionally, the WUR AP may transmit WUR Beacon frames as keep-alive WUR frames during on durations negotiated with a WUR non-AP STA (see 29.8.3 (WUR power management operation for a WUR AP)).*(#3102)*

29.8.2 WUR mode setup

**TGba Editor: *Insert a new paragraph below in this subclause as follows (#CID 3012):***WUR AP indicates the start time of one WUR duty cycle schedule in the Starting time of the WUR duty cycle subfield of the WUR Parameters field in WUR Mode element.

A WUR non-AP STA may indicate in the WUR Mode element its recommendation on which WUR channel to assign for itself if the WUR FDMA Support subfield in the WUR Capabilities element sent by the WUR non-AP STA is set to 1; otherwise, the WUR non-AP STA shall not recommend a WUR channel. The WUR non-AP STA may indicate in the WUR Mode element its recommendation on which data rate (LDR or HDR) to use for individually or group addressed WUR wake-up frames transmitted to the WUR non-AP STA if the 20MHz WUR PPDU with HDR Support subfield in the WUR Capabilities element sent by the WUR non-AP STA is set to 1; otherwise, the WUR non-AP STA shall not recommend a WUR data rate. The WUR non-AP STA should avoid repeatedly renegotiating WUR power management with the same rec­ommended WUR parameters in the WUR Mode element for the remainder of the association if the WUR AP doesn’t use the recommended value(s) from the WUR non-AP STA.

A WUR non-AP STA may set the Requested Keep Alive Frame field to 1 in the WUR Mode element to request the WUR AP to generate a keep-alive WUR frame during the on durations that are negotiated with the STA.*(#3102)*

**29.8.3 WUR power management operation for a WUR AP**

For each WUR non-AP STA that requests WUR power management service from an associated WUR AP, the WUR AP shall maintain a WUR status that indicates whether the WUR non-AP STA is in WUR mode or WUR mode suspend.

**TGba Editor: *Change the paragraph below in this subclause as follows (#CID 3012):***WUR AP indicates the start time of one WUR duty cycle schedule in the Starting time of the WUR duty cycle subfield of the WUR Parameters field in WUR Mode element.

If a WUR non-AP STA is in WUR mode, then:

* A WUR AP shall schedule for transmission a WUR Wake-up frame for the WUR non-AP STA during an on duration that is negotiated with the WUR non-AP STA to notify the WUR non-AP STA that the WUR AP intends to have operation with the WUR non-AP STA as described in 29.9.2 (WUR AP operation) and 29.9.3 (WUR non-AP STA operation) if the WUR non-AP STA is in the doze state. The WUR Wake-up frame classifies as a keep-alive WUR frame for a WUR STA that has requested the transmission of keep-alive WUR frames during WUR mode setup.
* A WUR AP shall schedule for transmission a WUR Beacon frame during an on duration that is negotiated with the WUR non-AP STA as a keep-alive WUR frame if the WUR AP does not schedule for transmission a WUR Wake-up frame for the WUR STA during that on duration and the WUR STA has requested the transmission of keep-alive WUR frames during a successful WUR mode setup (see 29.8.2 (WUR Mode Setup)).
* *(#3102)*The existing negotiated service periods between WUR AP and WUR non-AP STA for the WUR non-AP STA’s schedule are suspended, i.e., the WUR non-AP STA is not required to be in the awake state during the existing negotiated service period:
* After the WUR AP transmits a WUR Wake-up frame addressed to the WUR non-AP STA with an indication of individually addressed buffered BU(s), the WUR AP expects that the WUR non- AP STA is in the awake state at the earliest service period, which has end time larger than the received time of the frame plus the transition delay indicated by the WUR non-AP STA in the WUR Capabilities elements, following the existing PS operation (e.g., individual TWT) agreed between the WUR AP and the WUR non-AP STA.
* The parameters of the negotiated service period for the WUR non-AP STA’s schedule between the WUR AP and the WUR non-AP STA are maintained by the WUR AP.
* The WUR AP shall follow the wake-up operation defined in 29.9 (Wake-up operation).

NOTE-A WUR AP can only generate keep alive frames, which are WUR beacon frames, in the WUR primary channel. Hence, the AP can only assign these WUR non-AP STAs in the WUR primary channel to enable the keep alive operation mode.*(#3102)*