### IEEE P802.11Wireless LANs

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| 11ba D5.0 Comment Resolution for WUR Power Management |
| Date: 2019-12-26 |
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Abstract

This submission proposes resolutions for comments of TGba Draft D5.0 with the following CIDs:

5006, 5007, 5012, 5014, 5015, 5016

Revisions:

* 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 D5.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGba D5.0 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** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5012 | Mark Hamilton | 117.48 | 29.8.4 | A "WUR STA" has WUR implemented. Such a STA may not have negotiated WUR service/WUR mode (yet, or ever). But, such a STA can certainly still enter awake and doze states, without regard to WUR operation. Thus, the first sentence of this NOTE is misleading by implying WUR must be negotiated to be able to enter awake or doze states. Similarly, the second sentence seems to imply something about being able to do power save at all, and of course that's also independent of WUR mode or negiationr. In fact, it's not clear what the point of this NOTE is, at all. | Replace this NOTE, with "NOTE 1--The power management mode and WUR power state of a WUR non-AP STA operate independently." | Revised – We explain that the note is added because there have been questions on whether active/ps mode still operate as it is while WUR power management service is negotiated. Further, there have been questions on whether awake/doze state still operate as it is while WUR power management service is negotiated. The answer to both question is yes and the note is added for this purpose.We revise the note to use “regardless of whether” rather than “if” to clarify that it does not mean that active/ps mode or awake/doze state can only happen while the WUR non-AP STA is in WUR mode or WUR mode suspend. We further describe that “the change of power management mode and the change of negotiated WUR power management service to be in WUR mode or WUR mode suspend are independent.”TGba editor to make the changes shown in 11-19/2167r0 under all headings that include CID 5012. |
| 5014 | Mark Hamilton | 107.19 | 29.5.1 | If WUR mode is suspended, why does the non-AP STA maintain the ID list and stay configured to receive such WUR frames? | Delete "or in WUR mode suspend" from this sentence. | Revised – Agree in principle with the commenter. We note that the IDs is maintained while the WUR non-AP STA is in WUR mode or WUR mode suspend. However, it is true that the configured to received is based on WUR duty cycle operaton except vendor specific operation, which does not need to be standardized at all. We revise the sentence accordingly.TGba editor to make the changes shown in 11-19/2167r0 under all headings that include CID 5014. |
| 5015 | Mark Hamilton | 22.40 | 3.2 | The WUR non-AP STA only alternates between WUR awake and WUR doze states, when in power save mode. When in active mode, it can stay in WUR doze. | Insert, to become: "the WUR non-AP STA \_when in power save mode\_ alternates" | Revised – Agree in principle with the commenter. TGba editor to make the changes shown in 11-19/2167r0 under all headings that include CID 5015. |
| 5016 | Mark Hamilton | 85.2 | 11 | Since a non-AP STA in doze state, WUR mode and WUR awake state can send and receive WUR frames, it is not correct that it "is not able to transmit or receive", which is the definition of doze state. The definition of doze state needs to exclude the transmission and reception of WUR frames. | Add a change to the baseline subclause 11.2.1 to update the definitoion of doze mode, by changing "Doze:" description, inserting "non-WUR frames" after "not able to transmit or receive". | Revised – Agree in principle with the commenter. TGba editor to make the changes shown in 11-19/2167r0 under all headings that include CID 5016. |
| 5006 | Joseph Levy | 22.41 | 3.2 | Why is there a WUR doze state? Doze state is defined as the state in which the non-AP STA does not receive anything. Which is the what is meant by the WUR doze state. Hence there is no need for WRU doze, remove it from the specification and simply replace it with doze. | Replace "WRU doze" with "doze", throughout the specification. | Revised – Agree in principle with the commenter that there could be misunderstanding based on the current definition of doze state. We clarify that doze state is for the case of not being able to receive non-WUR PPDU. TGba editor to make the changes shown in 11-19/2167r0 under all headings that include CID 5006. |
| 5007 | Joseph Levy | 60.55 | 9.4.2.289 | Transition Delay is a WUR parameter, it does not indicate the maximum time for a non-AP STA to transition from doze to awake, it indicates the maximum time for a non-AP STA in WUR power management mode to transition to the awake sate in PS power management. | "Replace: ""Indicates the maximum time that the non-AP STA requires to transition from the doze state to the awake state. (see 11.2.1 (General))""With: ""Indicates the maximum time that the non-AP STA requires to transition from the WUR power management mode to the PS mode awake state. (see 11.2.1 (General))""" | Revised – We think that the reason of the potential confusion is probably that we do not clarify that doze state is revised for he case of not being able to receive non-WUR PPDU. As a result, the WUR feature can be added as an additional trigger for the WUR non-AP STA to go from doze to awake without touching the existing power save protocols. We revise the definition of doze state to clarify the confusion.TGba editor to make the changes shown in 11-19/2167r0 under all headings that include CID 5007. |
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**Discussion:** *None.*

***TGba editor: Change 29.8.4 WUR power management operation for a WUR non-AP STA***

***as follows (track change on):***

(…existing texts…)

NOTE 1—A WUR non-AP STA can be in the awake or doze state as defined in 11.2.1 (General) while in the power save
mode regardless of whether the WUR non-AP STA has negotiated WUR power management service to be in WUR mode or WUR mode suspend. A WUR non-AP STA can be in active mode or power save (PS) mode as defined in 11.2.3.2 (Non-AP STA power management modes) regardless of whether the WUR non-AP STA has negotiated WUR power management service to be in WUR mode or WUR mode suspend. The change of power management mode and the change of negotiated WUR power management service to be in WUR mode or WUR mode suspend are independent. (#5012)

(…existing texts…)

***TGba editor: Change 29.5.1 General***

(…existing texts…)

A WUR non-AP STA, which is in WUR mode or in WUR mode suspend, maintains a list of multiple IDs. A WUR non-AP STA is configured to receive one or more WUR frames that contain any of these IDs when the WUR power state of the WUR non-AP STA is in the WUR awake state due to WUR duty cycle operation as defined in 29.7 (WUR duty cycle operation).(#5014)

(…existing texts…)

***TGba editor: Change 3.2 Definitions specific to IEEE Std 802.11***

(…existing texts…)

**wake-up radio (WUR) mode:** A negotiation status between a WUR access point (AP) and a WUR non-AP
station (STA) in which the WUR power state of the WUR non-AP STA, while in power management mode, alternates between the WUR awake state and the WUR doze state based on the negotiated WUR parameters.(#5015)

(…existing texts…)

***TGba editor: Change 11.2.1 General as follows:***

**11.2.1 General**A STA can be in one of two power states:
— Awake: STA is fully powered.
— Doze: STA is not able to transmit or receive non-WUR PPDU and consumes very low power.(#5016, #5006, #5007)