IEEE P802.11  
Wireless LANs

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| LB237 CR WUR FDMA | | | | |
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Abstract

This submission proposes resolutions of comments received from TGba LB237.

(The proposed change is based on TGba Draft 2.0.)

* CIDs: 2702, 2705, 2440, 2703, 2704, 2757, 2706, 2449, 2519, 2634, 2804, 2451, 2050, 2472, 2049, 2051, 2048, ~~2056~~, 2659, 2159, 2290, 2294, 2302 (~~20~~22 CIDs)

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.***

| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
| 2702 | 19 | 42 | 3.2 | The definition of WUR primary channel should follow the same style of WUR channel or WUR Discovery channel. | suggest to change the definition of WUR primary channel to "The channel in which a WUR AP transmits WUR beacon frames." | Rejected-  The comment fails to identify a specific issue to be addressed. |
| 2705 | 19 | 42 | 3.2 | There is some grammatic error in the definition of WUR secondary channel. | suggest to change the definition of WUR secondary channel to "The 20 MHz channel that is adjacent to the WUR primary channel that together with the WUR primary channel form the WUR primary 40 MHz channel." | Rejected-  The definition of the WUR secondary channel follows the same editing style of the 802.11REVmd.  If the commenter still thinks that current wording is ambiguous, please submit a comment to REVmd. |
| 2440 | 19 | 45 | 3.2 | "NOTE--WUR primary channel can be different from the primary channel of the BSS" should be moved to either Clause 30 or Clause 31. The Clause 3.2 should contain just the definition of a term used in IEEE Std 802.11. | Move "NOTE--WUR primary channel can be different from the primary channel of the BSS" to Clause 30 or Clause 31. | Revised-  Agree in principle.  The NOTE is moved to clause 30.2.  TGba editor makes changes as specified in 11-19/0576r3 for CID 2440. |
| 2703 | 19 | 45 | 3.2 | The note needs some improvements. | Suggest to the note to read "The WUR primary channel of a BSS may be different than the primary channel of the BSS." | Revised-  Accept the proposed text change to the cited note. However, move the note to clause 30.2 (channel access), because clause 3.2 is not the right place to have such note.  TGba editor makes changes as specified in 11-19/0576r3 for CID 2440. |
| **Proposed Text Updates: CID 2440, 2703**  ***TGba Editor: Delete the following NOTE in the sub-clause 3.2 (Definitions specific to IEEE Std 802.11):***  NOTE—WUR primary channel can be different from the primary channel of the BSS.  ***TGba Editor: Insert the following NOTE at the end of the sub-clause 30.2 (Channel access):***  NOTE— The WUR primary channel of a BSS can be different from the primary channel of the BSS. | | | | | | |
| 2704 | 19 | 48 | 3.2 | In RevMD, the primary 40 MHz channel is associated with a BSS. The WUR primary 40 MHz channel definition should follow the same style since it is also assciated with a BSS. | suggest to revise the definition of WUR primary 40 MHz channel to be associated with a BSS. | Rejected-  In REVmd, the primary 40 MHz channel is defined only when the BSS operating width is 80 MHz, 160 MHz, or 80+80 MHz.  “primary 40 MHz channel: In an 80 MHz, 160 MHz, or 80+80 MHz very high throughput (VHT) basic service set (BSS), the 40 MHz channel that is used to transmit 40 MHz physical layer (PHY) protocol data units (PPDUs).”  But, the WUR primary 40 MHz channel does not have such restriction. So, there is no reason to mention the BSS in the definition of the WUR 40 MHz channel. |
| 2757 | 19 | 48 | 3.2 | Can the wake-up radio (WUR) secondary channel, or secondary 40 MHz channel, or primary 40 MHz channel or 80 MHz channel be different from the corresponding channels of BSS? | Please clarify | Rejected-  The comment fails to identify a specific issue to be addressed. It fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined. |
| 2706 | 19 | 55 | 3,2 | There is some grammatic error in the definition of WUR secondary 40 MHz channel. | suggest to change the definition of WUR secondary 40 MHz channel to "The 40 MHz channel that is adjacent to the WUR primary 40 MHz channel that together with the WUR primary 40 MHz channel form the WUR 80 MHz channel." | Rejected-  The definition of the WUR secondary channel follows the same editing style of the 802.11REVmd.  If the commenter still thinks that current wording is ambiguous, please submit a comment to REVmd. |
| 2449 | 46 | 7 | 9.4.2.292 | "WUR FDMA Channel Offset" should be "WUR Channel Offset" since this field is used for both WUR PPDU transmission and WUR FDMA PPDU transmission. | As shown in the comment | Revised-  Agree in principle.  TGba Editor replace “WUR FDMA Channel Offset” with “WUR Channel Offset” in Table 9-321d (Subfields of WUR Parameters field from WUR AP). |
| 2519 | 46 | 33 | 9.4.2.292 | The figure says WUR Channel Offset, but the table says WUR FDMA Channel Offset. | Use the same term (WUR FDMA Channel Offset or WUR Channel Offset) for the figure and the table. Probably just use WUR Channel Offset since the field is used for STA without using FDMA. | Revised-  Agree in principle.  TGba Editor replace “WUR FDMA Channel Offset” with “WUR Channel Offset” in Table 9-321d (Subfields of WUR Parameters field from WUR AP). |
| 2634 | 46 | 34 | 94.2.292 | The same subfield in Figure 9-772i and Table 9-321d are named differently: The second subfield in Figure 9-772i is labeled "WUR Channel Offset" subfield whereas Table 9-321d lists the "WUR FDMA Channel Offset" subfield. | Change subfield "WUR Channel Offset" in Figure 9-722i to "WUR FDMA Channel Offset" | Revised-  Agree in principle.  TGba Editor replace “WUR FDMA Channel Offset” with “WUR Channel Offset” in Table 9-321d (Subfields of WUR Parameters field from WUR AP). |
| 2804 | 47 | 7 | 9.4.2.292 | The name of the subfield "WUR FDMA Channel Offset" in Table 9-321d is inconsistent with the terms used in the encoding column, in the title of Table 9-321e, and in Figure 9-772i (at the location of B12-B14). | Delete "FDMA" from the name of the cited subfield in Table 9-321d. | Accepted |
| 2451 | 47 | 39 | 9.4.2.292 | It is not clear where the WUR primary channel information is indicated. It would be better to clearly state that the WUR primary channel is the WUR channel indicated in the WUR Operation element. | Change "The WUR Wake-up frames are to be transmitted in the WUR primary channel." to "The WUR Wake-up frames are to be transmitted in the WUR primary channel, which is indicated in the WUR Operation Class and the WUR Channel subfields in the WUR Operation element." | Accepted |
| 2050 | 80 | 10 | 30.1O | This paragraph can be merged with the next one. Please use "otherwise" paradigm. Also the third paragraph does not read well. The WUR Mode element that the WUR AP transmits to the WUR STA I am assuming. Please clarify. | As in comment. | Revised-  Agree in principle.  But, the third paragraph is moved to the end of the sub-clause 30.2.    TGba editor makes changes as specified in 11-19/0576r3 for CID 2050. |
| **Proposed Text Updates: CID 2050**  ***TGba Editor: Change the sub-clause 30.10 as the followings:***  ~~A WUR non-AP STA whose dot11WURFDMAChannelSwitchImplemented is false shall set the WUR FDMA Channel Switching Support subfield of the WUR Capabilities Information field of the WUR Capabilities element to 0.~~  ~~A WUR non-AP STA whose dot11WURFDMAChannelSwitchImplemented is true shall set the WUR FDMA Channel Switching Support subfield of the WUR Capabilities Information field of the WUR Capa­bilities element that it transmits to 1.~~  When dot11WURFDMAChannelSwitchImplemented is true, a WUR non-AP STA shall set the WUR FDMA Channel Switching Support subfield of the WUR Capabilities Information field of the WUR Capabilities element that it transmits to a WUR AP to 1. Otherwise, it shall set the WUR FDMA Channel Switching Support subfield to 0.  When a WUR AP receives from a WUR non-AP STA a WUR Capabilities element of which the WUR FDMA Channel Switching Support subfield of the WUR Capabilities Information field is equal to 0, the WUR AP shall set the WUR Channel Offset subfield of the WUR Parameters field of the WUR Mode element that it transmits to the WUR non-AP STA to 0. | | | | | | |
| 2472 | 80 | 20 | 30.10 | The paragraph in P80L20 describes the behavior of the WUR AP when the FDMA Channel Switching Support subfield of the WUR Capabilities Information field of the WUR Capabilities element from a WUR non-AP STA is set to 0. This is actually when the WUR non-AP STA doesn't suppor the WUR FDMA operation. Therefore, this paragraph should be moved to the WUR AP Operation clause (30.8.2). Also, in the TGba D2.0, the relationship between the WUR primary channel and the WUR channel is not clearly stated. I suggest to add a sentence saying that "When the WUR Channel Offset subleid is set to 0, the WUR Channel is same as the WUR primary channel, i.e. the WUR Wake-up frame and the WUR Beacon frame are transmitted on the same channel." | As shown in the comment | Revised-  The proposed clarification text from the commenter is added as the NOTE at the end of the sub-clause 30.2.  But, in the WUR FDMA operation side, P80 L20 is also needed in the sub-clause 30.10. Adding the NOTE in the sub-clause 30.2 may be enough.  TGba editor makes changes as specified in 11-19/0576r3 for CID 2472. |
| **Proposed Text Updates: CID 2472**  ***TGba Editor: Insert the following NOTE at the end of the sub-clause 30.2:***  NOTE- When the WUR Channel Offset subleid is set to 0, the WUR Channel is same as the WUR primary channel, i.e., the WUR Wake-up frame and the WUR Beacon frame are transmitted on the same channel. Otherwise, the WUR Channel may be differerent from the WUR primary channel (see 30.10 (WUR FDMA operation)) | | | | | | |
| 2049 | 80 | 31 | 30.10.1 | The frame certainly cannot be a frame that would cause a WUR STA in the primary to wake up. Please clarify. | As in comment. | Revised-  Agree in principle.  TGba editor makes changes as specified in 11-19/0576r3 for CID 2049. |
| **Proposed Text Updates: CID 2049**  ***TGba Editor: Change the sub-clause 30.10.1 as the followings:***  In any of the above actions, if the WUR AP does not have a pending WUR frame intended for WUR non-AP STAs on the WUR primary channel, then the WUR AP shall transmit a WUR frame, which can be any WUR frame that does not cause a WUR STA on the primary channel to wake up, on the WUR primary channel. | | | | | | |
| 2051 | 80 | 41 | 30.1O | For at least aPPDUMaxTime after each TWBTT. | As in comment. | Revised-  Agree in principle.  TGba editor changes “for aPPDUMaxTime” to “for at least aPPDUMaxTime”. |
| 2048 | 80 | 58 | 30.10.1 | It is not clear what identical means here. Please clarify. | As in comment. | Revised-  Since the PHY-CCA.indication primitive can be reused, additional changes are not necessary.  TGba editor makes changes as specified in 11-19/0576r3 for CID 2048. |
| **Proposed Text Updates: CID 2048**  ***TGba Editor: Delete the following paragraph from the sub-clause 30.10.1:***  ~~If the MAC receives a PHY-CCA.indication primitive with the channel-list parameter present, the channels considered idle are defined in Table 10-16 (Channels indicated idle by the channel-list parameter) in which the primary channel, secondary 20 MHz channel, and the secondary 40 MHz channel are identical to the WUR primary channel, the WUR secondary 20 MHz channel, and the WUR secondary 40 MHz channel.~~ | | | | | | |
| ~~2056~~ | ~~80~~ | ~~61~~ | ~~30.10.1~~ | ~~Please clarify how the multiplexing is done for the WUR frames in the WUR FDM PPDU. And also explicitly allow each subchannel to carry one or more WUR frames so that the need of using padding is minimized. The technical issue of using padding is that the airtime is wasted.~~ | ~~As in comment.~~ | ~~Need submission~~ |
| 2659 | 81 | 29 | 30.10.1 | "In any of the above actions, if the WUR AP does not have a pending WUR frame intended for WUR non-AP STAs on the WUR primary channel, then the WUR AP shall transmit a WUR frame, which can be any WUR frame, on the WUR primary channel." If the AP doesn't have a pending WUR frame on the WUR primary channel, then why should the AP transmit a WUR frame on the WUR primary channel? If it doesn't have a pending WUR frame on the WUR primary channel, then the WUR primary channel can be punctured. If it has a pending WUR frame on the WUR primary channel, then the transmission should be deferred until the WUR primary channel becomes idle. Furthermore, does "which can be any WUR frame" need to be emphasized here? | Revisit the sentence and clarify. | Rejected-  If the WUR AP doesn't have a pending WUR frame on the WUR primary channel, then the WUR primary channel can’t be punctured.  As per the baseline rule, the TXOP holder shall not send a PPDU without occupying the primary channel. |
| 2159 | 88 | 6 | 30.1 | The FDMA PHY makes 802.11ba radio causes interference to very large BW. This may reduce efficiency of other 802.11 radios and endanger good performacne of the WLAN radios | Delete FDMA mode and only allow 802.11ba transmissions in a 20 MHz band. | Rejected-  The WUR FDMA frames can be sent only if the wide bandwidth are available to be used.  There is no difference on the interference level comparing with the existing 40/80/80+80 MHz transmissions.  Efficiency gain of the wide bandwith transmission is already proved in 802.11n/ac/ax.  If there is additional consideration points comparing with the existing wide bandwidth transmission, please provide the detail. |
| 2290 | 67 | 24 | 32.1.2 | If the format is WUR-FDMA, need to add a vector of data rates for each 20Mhz channel | Picking up on comments made in the previous letter ballot on D1.0, the TG did not properbly address the issue raised in the comment, nor does the TG provide an indication that the text commented on has been deleted and hence the comment does not apply. (Note, page and line and sublause number refer to D1.0). In fact, as stated in the TGba minutes (11-19/226r0), the intend of the task group was to "Move to resolve CIDs that have no approved resolution as rejected with a reason read "TGba is unable to reach consensus on a resolution" in the interest of releasing draft 2.0". Also, the statement ""TGba is unable to reach consensus on a resolution" was added to the motion text there was one person speaking against the motion." was only added to the motion after objection to the original motion trying to reject comments in bulk with the reason of releasing a new LB.  The TG is asked to give the original comment due consideration and debade the proposed comment resolution as included in 11-18/1794r10. The referenced document includes an actionable comment resolution. | Rejected-  The TXVECTOR parameter WUR\_DATARATE is already categorized as “MU”.  And, “MU” means that the parameter is present for WUR PPDU and is present per user for WUR FDMA PPDU. |
| 2294 | 67 | 4 | 32.1.2 | Unlike 11ax, in WUR the preamble puncturing in 80 MHz also allows the case where both the secondary 20 MHz as well as one of the two 20 MHz sub-channel in secondary 40 MHz are punctured. | Picking up on comments made in the previous letter ballot on D1.0, the TG did not properbly address the issue raised in the comment, nor does the TG provide an indication that the text commented on has been deleted and hence the comment does not apply. (Note, page and line and sublause number refer to D1.0). In fact, as stated in the TGba minutes (11-19/226r0), the intend of the task group was to "Move to resolve CIDs that have no approved resolution as rejected with a reason read "TGba is unable to reach consensus on a resolution" in the interest of releasing draft 2.0". Also, the statement ""TGba is unable to reach consensus on a resolution" was added to the motion text there was one person speaking against the motion." was only added to the motion after objection to the original motion trying to reject comments in bulk with the reason of releasing a new LB.  The TG is asked to give the original comment due consideration and debade the proposed comment resolution as included in 11-18/1794r10. The referenced document includes an actionable comment resolution. | Revised-  The TXVECTOR parameter CHANNEL\_BANDWIDTH has the following values:   * WUR\_CBW\_PUNC80-PRI-SEC-1 for subchannel puncturing in 80 MHz, where in the preamble only the secondary 20 MHz and the lower 20 MHz subchannel in secondary 40 MHz is punctured. * WUR\_CBW\_PUNC80-PRI-SEC-2 for subchannel puncturing in 80 MHz, where in the preamble only the secondary 20 MHz and the higher 20 MHz subchannel in secondary 40 MHz is punctured.   But, the proposed change has been updated from CID 2590 of <https://mentor.ieee.org/802.11/dcn/19/11-19-0570-02-00ba-crs-for-phy-introduction-d2-0.doc>.  TGba editor needs no update for this CID. |
| 2302 | 66 | 23 | 32.1.2 | There is nothing in the TXVECTOR to indicate to the PHY which PSDU is transmitted on which 20MHz channel, in the case of WUR\_FDMA | Picking up on comments made in the previous letter ballot on D1.0, the TG did not properbly address the issue raised in the comment, nor does the TG provide an indication that the text commented on has been deleted and hence the comment does not apply. (Note, page and line and sublause number refer to D1.0). In fact, as stated in the TGba minutes (11-19/226r0), the intend of the task group was to "Move to resolve CIDs that have no approved resolution as rejected with a reason read "TGba is unable to reach consensus on a resolution" in the interest of releasing draft 2.0". Also, the statement ""TGba is unable to reach consensus on a resolution" was added to the motion text there was one person speaking against the motion." was only added to the motion after objection to the original motion trying to reject comments in bulk with the reason of releasing a new LB.  The TG is asked to give the original comment due consideration and debade the proposed comment resolution as included in 11-18/1794r10. The referenced document includes an actionable comment resolution. | Revised-  Agree in principle.  The TXVECTOR needs to provide a position of 20 MHz channel on which the PHY transmits a WUR frame.  TGba editor makes changes as specified in 11-19/0576r3 for CID 2302. |

**Proposed Text Updates: CID 2302**

***TGba Editor: Insert the following row into Table 31-1 (WUR\_TXVECTOR and WUR\_RXVECTOR parameters):***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| WUR\_ CH\_OFFSET | FORMAT is WUR\_BASIC or WUR\_FDMA | Determines the WUR channel on which WUR Wake-up frames are transmitted.  Enumerated type: 0 indicates the WUR Wake-up frame is transmitted in the WUR primary channel. 1 indicates the WUR Wake-up frame is transmitted in first higher frequency 20 MHz channel relative to the WUR primary channel. 2 indicates the WUR Wake-up frame is transmitted in first lower frequency 20 MHz channel relative to the WUR primary channel. 3 indicates the WUR Wake-up frame is transmitted in second higher frequency 20 MHz channel relative to the WUR primary channel. 4 indicates the WUR Wake-up frames are to be transmitted in second lower frequency 20 MHz channel relative to the WUR primary channel. 5 indicates the WUR Wake-up frames are to be transmitted in third higher frequency 20 MHz channel relative to the WUR primary channel. 6 indicates the WUR Wake-up frames are to be transmitted in third lower frequency 20 MHz channel relative to the WUR primary channel. | MU | Y |