IEEE P802.11
Wireless LANs

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| LB235 CR Subclause 31.9  |
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Abstract

This submission proposes resolutions of comments received from TGba LB235.

(The proposed change is based on TGba Draft 1.0.)

* CIDs: 1029, 469, 146, 577, 1030, ~~1141~~, 361, 362, 858, 171, 485, 580, 94, 147, 1031, 815, 1032, 1033, 574, 470, 148, 172, 173, 174, 175, 859, 149, 1034, 428 (~~29~~28 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** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 1029 | 62.00 | 31.9 | The WUR FDMA operation should be limited to only a WUR Wake-Up frame. | Change "WUR frame" whenever it appears under 31.9 including its subclause to "WUR Wake-Up frame". | Rejected- Such limitation is not required.  |
| 469 | 62.59 | 31.9 WUR FDMA operation | Rewrite paragraph for clarity. | Please rewrite this paragraph to better clarify the process. Stringing multiple statements of conditional logic in this manor causes confusion and will be prone to implementation error. | Revised- Agree in principle.The paragraph is rewriteen based on CID 469, 146, 577, 1030. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 146 | 62.60 | 31.9 | This paragraph is essentially one sentence which makes it very difficult to follow. Please split into separate sentences and ensure that the appropriate normative verbs are used. Also please add a note that motivates the use of aPPDUmaxtime for the frame deferral rule in the last bullet.Also in the last paragraph, it is not sure what defined means. This should be a rule that specifies that the WUR STA needs to reside in that channel to recevie any potential WUR frames transmitted to it by the AP. | As in comment. | Revised- Agree in principle.The paragraph is rewriteen based on CID 469, 146, 577, 1030. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 577 | 62.60 | 31.9 | Sentence (paragrpah) is very hard to understand. There are two concepts here: that the AP has the flexibility to choose an alternative WUR channel if the STA is Channel Switching capable, and that the AP shall consider timing for the duty cycle, Beacons, etc. to avoid timing collisions. | Split this into different sentences: 1) When an AP received a subfield set to 1, it \_may\_ set the WUR Channel Offset to a non-zero value (reference to Table 9-318d (not 9-318c)). 2) Such an AP, \_shall\_ also consider timing overlaps mentioned here. The timing considerations really need more than one long sentence, in themselves. | Revised- Agree in principle.The paragraph is rewriteen based on CID 469, 146, 577, 1030. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 1030 | 62.60 | 31.9 | The sentence is too long. Devide it into several sentences to be more understandable.Should "... schedule does not overlap with the TWBTTs ..." in pp.ll 62.65 be "... schedule not to overlap with the TWBTTs ..."?Should "... the WUR AP schedules for transmission WUR Beacon frames if ..." in pp.ll 62.65 be "... the WUR AP schedules for transmitting WUR Beacon frames if ..."? | As in comment. | Revised- Agree in principle.The paragraph is rewriteen based on CID 469, 146, 577, 1030. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| ~~1141~~ | ~~62.60~~ | ~~31.9~~ | ~~A STA should have remedy if a WUR channel assigned to it by the AP is not desired, due to channel condictions etc.~~ | ~~add the signaling and procedures for a STA to remedy the case when a WUR channel is assigned to itself but the channel condition is bad and need to be switched.~~ |  |
| 361 | 62.65 | 31.9 | Why does TWBTTs have the "s" at the end? | TWBTT | Rejected-“s” means a plural. So, it means that a plural of TWBTT are not overlapped with the negotiated WUR duty cycle schedule.  |
| 362 | 63.07 | 31.9 | Why does TWBTTs have the "s" at the end? | TWBTT | Rejected-“s” means a plural. So, it means that a plural of TWBTT are not overlapped with the negotiated WUR duty cycle schedule. |
| 858 | 63.05 | 31.9 | Based on the latest encoding, On Duration field (size 4 bytes units 4 us), can indicate exactly any value indicated by Duty cycle (2 bytes + 2 bytes Unit with granularity 4 us.). Remove "or greater than". | As in comment. | Rejected-The value indicated in the On Duration subfield can be greather than the value of the Duty Cycle Period subfield.  |
| 171 | 63.09 | 31.9 | "The WUR AP shall not transmit any WUR frame addressed to the WUR non-AP STA for aPPDUMaxTime defined in Table 21-29 (VHT PHY characteristics) from a TWBTT". Why the aPPDUMaxTime is used here? Shouldn't be WUR beacon time + max switching time +CSMA time? | as in the comment | Revised- Change to aPPDUMaxTime of WUR PPDU. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| * WUR FDMA operation

If a WUR non-AP STA is in WUR Mode, then: When a WUR AP receives from a WUR non-AP STA Capabilities element of which the WUR Channel Switching subfield of the WUR Capabilities Information field is equal to 1, the WUR AP ~~shall~~ may set the WUR Channel Offset subfield of the WUR Parameters field of the WUR Mode element that it transmits to ~~any~~ a nonzero value as defined in Table 9-318c (Subfields of WUR Parameters field from WUR AP), subject to the following constraints: * The negotiated WUR duty cycle schedule does not overlap with the TWBTTs at which the WUR AP schedules ~~for~~ transmission of WUR Beacon frames ~~if the value of WUR Channel Offset subfield of the WUR Parameters field of the WUR Mode element that the AP transmits is not 0~~, except for the case when the value indicated in the On Duration subfield of the WUR Parameters field in the WUR Mode element received from ~~a~~the WUR non-AP STA is equal to or greater than the value ~~of~~ indicated in the Duty Cycle Period subfield~~, in which case,~~
* ~~The negotiated WUR duty cycle schedule may overlap with the TWBTTs~~.
* The WUR AP shall not transmit in the WUR secondary channel and WUR secondary 40 MHz channel any WUR frame addressed to the WUR non-AP STA for aPPDUMaxTime defined in Table ~~21~~32-~~29~~14 (~~VHT~~ ~~PHY characteristics~~WUR PPDU Time and Length Characteristics) plus NAVSyncDelay (#171) from ~~a~~the TWBTTs.

The WUR channel of a WUR non-AP STA with dot11WURChannelSwitchImplemented equal to true is defined by the WUR Channel Offset subfield of the WUR Parameters field of the WUR Mode element that it receives from its associated WUR AP. |
| 485 | 63.18 | 31.9.1 | WUR FDAM channel access does not require additional channel access rules. Standard 802.11 channels assess rules should be adequate. The device that is requesting the WUR PPDU be sent should be simply requesting that a PPDU be sent via standard 802.11 mechanisms. | Delete section WUR FDMA channel assess and replace it with a WUR PPDU request mechanism. There is no entity in an AP that will manage WUR PPDUs and WUR devices, this is a new entity and should be described as such. An AP should remain an AP. | Rejected-The WUR FDMA support the preamble punctured transmission that is little different with 11ax preamble punctured transmission. Because the baseline channel access rules are not covering all possible scenarios, the WUR FDMA channel access rules have been defined.  |
| 580 | 63.21 | 31.9.1 | "In PHY-CCA.indication primitive and Table 10-16, the primary channel, ... are replaced by the WUR primary channel, ...." When? Why are these being replaced, and not just added to the list of possible indications? (Otherwise, how would the MAC receiving this .indication know which was being indicated?) | Clarify or modify to remove exlain how this works. | Revised- Agree in principle.Clarification texts are added. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 94 | 49.21 | 31.2 | It is not clear what "the primary channel is replaced by the WUR primary channel" means. The primary channel is simply the one that the AP is using for the BSS and the WUR frame is yet another frame that can be transmitted by the AP. Please clarify. | As in comment. | Revised- Because the WUR primary channel can be different from the primary channel of the PCR, the primary channel concept should be changed.However, as in the comment of CID 580, the current text needs more clarification. Clarification texts are added. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 147 | 63.26 | 31.9.1 | This is already the case based on the channel rules defined in 31.2. No need to repeat here unless it was an exception which is not. So propose to remove this sentence. | As in comment. | Revised- The access category selection is not a main motivation of this sentence. The point is that multiple WUR frames can sent in a single PPDU. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 1031 | 63.26 | 31.9.1 | The general access rules for transmitting WUR frames are described in 31.2. By not referring to 31.2, rules for such as CW and retry counters should be repeated.Refer to 31.2 and add extra rules if necessary for WUR FDMA operation here. | As in comment. | Revised- In 31.2 (Channel access), the spec said that additional channel access rule for the WUR FDMA operation is described in 31.9.1. But, for the more clarification, some texts in 31.2 has been updated. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 815 | 63.29 | 31.9.1 | STAs have no intentions. There are six uses of 'intends' in the text. Rewrite text to say what STAs do. | A WUR AP transmitting a WUR FDMA PPDU ... shall perform exactly one of the ... | Rejected- From the baseline spec, it looks like that the STA can have opertation based on the STA’s intention.  |
| 1032 | 63.29 | 31.9.1 | Add a description that when the WUR secondary channel is busy, the AP can either transmit in 20 MHz WUR PPDU on the primary 20 MHz channel, or re-access. | As in comment. | Revised- 20 MHz WUR PPDU on the WUR primary channel is not related with the WUR FDMA operation. But, for the more clarification, some texts in 31.2 has been updated. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 1033 | 63.29 | 31.9.1 | STAs that has WUR channel offset, i.e., those required to listen to channels other than the primary 20 MHz channel to receive WUR Wake-Up frames, has disadvantage comprared to those without WUR channel offset. This is because secondary channels are hard to acquire. It is rather better to just use puctured PPDU for FDMA access. | Delete access rules a) and b). Mandate transmitting punctured WUR FDMA PPDU when the AP supports WUR FDMA operation. | Rejected- The preamble punctured PPDU transmission in the baseline (e.g., 802.11ax) is an optional feature. The preamble punctured WUR FDMA should be considered as an optional feature.  |
| 574 | 63.32 | 31.9.1 | According to table 9-318d, the WUR channel offset could be first upper 20MHz relative to WUR priimary channel or first lower 20MHz relative to WUR primary channel. Can WUR FDMA PPDU be sent on upper 20 + lower 20 and WUR primary channels?If allowed, then there is not a fixed WUR primary 40MHz channel to be used in this section | clarify allowed combination for table 9-318d | Rejected- The scenario that the commenter mentioned is for the 80 MHz WUR FDMA PPDU on the WUR primary 80 MHz channel, not a fixed WUR primary 40 MHz channel.  |
| 470 | 63.35 | 31.9.1 WUR FDMA Channel Access | Abbreviation "PIFS" needs to be defined. | The first use of "PIFS" needs to be defined or added to section 3.4. | Rejected-It is already in 3.4 (Abbreviations and acronyms) of the baseline.  |
| 148 | 63.38 | 31.9.1 | Seems to imply that the WUR FDMA contains only one WUR frame per subchannel. If there is space left in that subchannel then there is no reason for the AP to not send another WUR frame to a different STA. | As in comment. | Rejected- Because the remaining resource space is very limited, allowing multiple WUR frames per a subchannel is not so beneficial. Also, an implementation complexity is high.  |
| 172 | 63.35 | 31.9.1 | Change "secondary channel" to secondary 20Mhz channel | as in the comment | Rejected- As shown in clause 3.2, the WUR secondary channel is a correct terminology. |
| 173 | 63.44 | 31.9.1 | Change "secondary channel" to secondary 20Mhz channel | as in the comment | Rejected- As shown in clause 3.2, the WUR secondary channel is a correct terminology.  |
| 174 | 63.53 | 31.9.1 | Change "secondary channel" to secondary 20Mhz channel | as in the comment | Rejected- As shown in clause 3.2, the WUR secondary channel is a correct terminology.  |
| 175 | 63.59 | 31.9.1 | Change "except when the subchannel was not idle or the WUR AP does not have a pending WUR frame intended for WUR non-AP STAs listening on that subchannel" to "except for any 20MHz subchannel that was not idle or the WUR AP does not have a pending WUR frame intended for WUR non-AP STAs listening on that subchannel" | as in the comment | Rejected- Change from “except when the subchannel was not idle” to “except for any 20MHz subchannel that was not idle” is not correct. Because the WUR AP does not schedule a WUR frame transmission on 20 MHz subchannel when that subchannel is not idle.  |
| 859 | 63.62 | 31.9 | Add the condition that WUR AP can also just transmit padding in WUR primary channel. | As in comment. | Rejected- Any WUR frame transmission on the WUR primary channel is enough.  |
| 149 | 63.63 | 31.9.1 | This sentence in not clear in its intention. Is it trying to say that the primary channel shall be busy if the AP is sending a WUR FDMA frame? lPlease clarify | As in comment. | Revised- Agree in principle. The primary channel shall be busy. Clarification texts are added. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| 1034 | 63.63 | 31.9.1 | This happens when it is case c) 2) and the busy subchannel is the primary 20 MHz. But isn't it strange that a frame can be transmitted in that busy channel? It will interfere with other systems. Then, what is intended should be that puncturing is also applied when there is no STA to transmit WUR Wake-up frame on the primary 20 MHz channel. It needs clarification. | As in comment. | Revised- Agree in principle. The primary channel shall be busy. Clarification texts are added. TGba editor makes changes as shown in the as specified in 11-19/0013r0. |
| * Channel access

A WUR AP that intends to transmit a WUR frame shall contend for the medium as defined in 10.24.2 (HCF contention based channel access (EDCA)) except that:* If the MAC receives ~~In~~ a PHY-CCA.indication primitive with the channel-list parameter present, the channels considered idle are defined in ~~and~~ Table 10-16 (Channels indicated idle by the channel-list parameter)~~,~~ in which the primary channel is ~~replaced by~~ identical to (#580, 94) the WUR primary channel.
* The WUR AP may use any AC for sending a WUR frame.
* The WUR AP that sent a WUR frame using the EDCAF of a particular AC shall not update the CW and the retry counters for that AC regardless of whether the WUR frame was successfully received by the intended recipient.
* The WUR AP may transmit a WUR PPDU on the WUR primary channel. (#1032)
* The WUR AP that support the WUR FDMA operation may transmit a WUR FDMA PPDU on the WUR primary 40 MHz channel and WUR primary 80 MHz channel as described in 31.9.1 (WUR FDMA channel access). (#1031)

~~Channel access on WUR primary 40 MHz channel and WUR primary 80 MHz channel is described in 31.9.1 (WUR FDMA channel access).~~* WUR FDMA channel access

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) where If the MAC receives a ~~In~~ PHY-CCA.indication primitive with the channel-list parameter present, the channels considered idle are defined in ~~and~~ 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 ~~replaced by~~ identical to (#580) the WUR primary channel, the WUR secondary 20 MHz channel, and the WUR secondary 40 MHz channel. The WUR AP may ~~use any AC for~~ send~~ing~~ (#147) multiple WUR Wake-up frames in a WUR FDMA PPDU. If a WUR AP intends to transmit a WUR FDMA PPDU (as defined in 10.24.2.4 (Obtaining an EDCA TXOP) and 31.2 (Channel access)), the WUR AP shall perform exactly one of the following actions: * Transmit the 40 MHz WUR FDMA PPDU in the WUR primary 40 MHz channel when the following conditions are met:
* The WUR secondary channel was idle during an interval of PIFS immediately preceding the start of the TXOP.
* The WUR AP schedules one WUR frame transmission on each of 20 MHz subchannels of the WUR primary 40 MHz channel.
* Transmit the 80 MHz WUR FDMA PPDU on the WUR primary 80 MHz channel when the following conditions are met:
* Both the WUR secondary channel and the WUR secondary 40 MHz channel were idle during an interval of PIFS immediately preceding the start of the TXOP.
* The WUR AP schedules one WUR frame transmission on each of 20 MHz subchannels of the WUR primary 80 MHz channel.
* Transmit the 80 MHz preamble punctured WUR FDMA PPDU on the WUR primary 80 MHz channel when the following conditions are met:
* At least one of the 20MHz subchannels of the WUR secondary channel and the WUR secondary 40 MHz channel were idle during an interval of PIFS immediately preceding the start of the TXOP.
* The WUR AP schedules one WUR frame transmission on each of 20 MHz subchannels of the WUR primary 80 MHz channel, except when the subchannel was not idle or the WUR AP does not have a pending WUR frame intended for WUR non-AP STAs listening on that subchannel.

In any of the above actions, ~~if the WUR AP transmits any WUR frame on a channel that is not the WUR primary channel~~ if the WUR AP does not have a pending WUR frame intended for WUR non-AP STAs on the WUR primary channel (#149, 1034), then the WUR AP shall transmit a WUR frame, which can be any WUR frame, on the WUR primary channel. |
| 428 | 49.20 | 31.2 | The WUR transmission should be at maximum 20 MHz wide in 2.4 GHz. 2.4 GHz spectrum has many other radios and BSSs can consuming a lot of bandwidth to WUR reduces available resources of existing devices and networks. | Please constraint WUR to operate only in 20 MHz BW at 2.4 GHz band. | Rejected- Comparing with 40 MHz BSS operation of PCR in 2.4 GHz, 40 MHz WUR FDMA does not waste much resource.  |