IEEE P802.11
Wireless LANs

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| Resolution for CIDs on Power Save with UL OFDMA-based Random Access |
| Date: 2016-11-03 |
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Abstract

This submission contains resolution text to CIDs 195, 723, 779, 780, 1087, 1088, 2179, 2387, 2672, 2673, and 2674 that should be incorporated in P802.11ax D1.0:

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| **CID** | **Page Number** | **Line Number** | **Comment** | **Proposed Change** | **Resolution** |
| 195 | 85 | 6 | The following needs to be clairifed in this subclause: The start times are indicated in a TWT element carried in the Beacon, the STA may go to doze state if it is a PS STA, and trigger frame for random access should rather be referred to as a Trigger frame that contains one or more random RUs, Also this is one power save mechanism rather than mechanisms. | As in comment | **Revised**Agreed in principle and revised the text to provide the details of signalling in the TWT element. TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx.  |
| 723 | 27 | 55 | The TWT may be signaled to contain at least one RU for random access. The clause 25.13.2 is not using TWTs to specify when the UL MU Random access is in use. Please harmonize the both clauses to use the same mechanism. | Harmonize clause 25.13.2 and this clause to use the same power save mechanisms for the random access. | **Revised** Agreed in principle and revised the text to provide the details of signalling in the TWT element. TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx |
| 779 | 67 | 3 | The power save mechanism for UL OFDMA looks very similar to TWT mechanism. Why two similar mechanisms are needed? | Combine the power save mechanisms for OFDMA random access and the TWT. The random access is used by the non-associated STAs, so it coudl make sense if there are two separate Cascaded bits, one for random access and other for the TWT SPs and trigger frames. | **Revised**There is no need for 2 separate Cascaded bits as proposed by the Commenter. The power save mechanism need not be differentiated for associated and unassociated STAs with respect to random accessprocedure. The value in the TWT Flow Identifier subfield in the TWT element distinguishes the TWT SP for random access operation or for scheduled operation. This subclause is mainly needed to illustrate the power save for random access, whilereference is made to TWT element for signalling ofstart time of Trigger frames for random access. TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx  |
| 780 | 67 | 43 | The power save rules when an HE STA may go to doze are not clear. Clarify what is the preferred operation instead of two MAY statement on alternative signaling. | Clarify more clearly when the STA should or even shall stay awake. And when it may go to Doze. | **Revised** TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx  |
| 1087 | 67 | 9 | Trigger frame start time in a Beacon frame can be indicated by TWT element | Replace "Trigger frame start time(s)" with "TWT parameter sets" | **Revised**Modified the Trigger frame start times by “start timesof Trigger frames” TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx  |
| 1088 | 67 | 31 | Trigger frame start time in a Beacon frame can be indicated by TWT element | Replace the tex:"When an HE STA receives a Beacon with the value of Trigger frame start time for random access, it may enter the doze state till expiration of the value indicated in the Beacon."with the text:"When an HE STA receives a TWT element in a Beacon with the TWT Flow Identifier set to 2, it may enter the doze state till the Target Wake Time of the TWT element indicated in the Beacon." | **Revised** Accepted the text with inclusion of the additional text of a value of 1 in the Broadcast subfield along with the value of 2in the TWT Flow Identifier TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx  |
| 2179 | 67 | 44 | MU UL OFDMA with random access:A random access may be enabled by a sequence of Trigger Frames.There is missing the case wherein the OBO expires during a sequence of trigger frames with random access | Add the following case:If the OBO counter decrements to a zero value with the random access procedure in a Trigger Frame with Cascade Indication set to 1, it may enter the doze state after its transmission. | **Rejected**If the STA has recently received a DL PPDU with a value in MD subfield, the AP would schedule an RU in the following Trigger frame; there would not be a need for the STA to participate in random access; the use case when the value in the Cascade Indication subfield is used in when the STA is either unassociated or comes out of power save and the APis unaware of the STA activity. Therefore, entering to the doze state is completely dependent only on the OBO count itself for transmission of UL PPDU.  |
| 2387 | 53 | 14 | how does AP indicate the target trigger frame transmit time in the beacon is not defined in the spec. It needs to define the IE and procedure in the spec |  | **Revised**The revised text illustrates that the indication of one orMultiple start times are in the TWT element. No additional IEs are required for such signalling. TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx  |
| 2672 | 67 | 10 | Indication of Trigger frame start time can also be included in other management frames, especially for unassociated STAs. | Modify the second sentence to "... for random access in the Beacon or other management frames such as Probe Response frames.". Also, modify the following sentence at the end of the third paragraph: "When an HE STA receives a Beacon or other management frame with including the value of Trigger frame start time for random access, it may enter the doze state till the expiration of the value indicated in the management frame." | **Revised**Agreed in principle and included as directed, exceptmentioning about Probe Response frame (the TWT element subclause covers the details)TGax Editor to make the changes as in 11-16-1458-00-00ax-25.13.2\_Power\_Save\_UL\_OFDMA\_based\_random\_access\_v0.docx  |
| 2673 | 67 | 34 | "Sequence of Trigger frames" is not clear. Need further clarification. | Modify the text to "If random acces is enabled by a sequence of Trigger frames within a trigger-enabled TWT SP, then ...". | **Accepted** |
| 2674 | 67 | 42 | There's no describtiopn until when a STA can stay in the doze state when the Cascade Indication field is set to 0. Also, Cascade indication of 0 only implies that there will not be any further UL MU transmission, and it does not give any information on DL transmission. Therefore, the STA cannot go to doze state unless it is clear that there's no DL traffic for the STA. | Modify the sentence to "If the OBO counter decrements to a non-zero value with the random access procedure in a Trigger frame with Cascade Indication field set to 0 and More Data (MD) subfield of the most recently received downlink frame intended to it is set to 0, it may enter the doze state immediately until the end of the trigger-enabled TWT SP." | **Rejected**If the STA has recently received a DL PPDU with a value in MD subfield, the AP would schedule an RU in the following Trigger frame; there would not be a need for the STA to participate in random access; the use case when the value in the Cascade Indication subfield is used in when the STA is either unassociated or comes out of power save and the APis unaware of the STA activity. Therefore, entering to the doze state is completely dependent only on the OBO count itself for transmission of UL PPDU.  |

Revision History:

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

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

**TGax Editor: *Modify the subclause 25.15.2 as follows***

* Power save with UL OFDMA-based random access

This subclause(#1304) illustrates the power save mechanisms for HE STAs using the(#1601) random access procedure (see 25.5.2.6.1 (Random access procedure)).

An HE AP may indicate values of one or multiple start time(s) of Trigger frame(s) for random access in the broadcast TWT element that is included in the Beacon frame or a management frame as described in 25.7.3.2 (Rules for TWT scheduling STA)(#723). The power save operation is shown in Figure 25-8 (Trigger frame (TF) start time in the Beacon frame for power save operation with random access operation(#2852)) with the indication of the start time for a Trigger frame for random access in a Beacon .

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| * Trigger frame (TF) start time in the Beacon frame for power save operation with random access operation(#2852)
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An HE STA that receives a Beacon frame or a management frame containing a TWT element that has a value of 1 in the Broadcast subfield and a value of 2 in the TWT Flow Identifier subfield may enter the doze state until(#1602) the start of that TWT SP as described in 25.7.3.3 (Rules for TWT scheduled STA(#1657)(#958)(#2400)(#142)(#957)).(#723)

If random access(#646) is enabled by a sequence of Trigger frames within a Trigger-enabled TWT SP, then all the Trigger frames in the sequence shall have the Cascade Indication field set to 1, except for the last Trigger frame in the sequence, which(#1603) shall have the Cascade Indication field set to 0.

An HE STA may use the value indicated in the Cascade Indication field in a Trigger frame to enter the doze state. If the OBO counter decrements to a non-zero value with the random access procedure in a Trigger frame with Cascade Indication field set to 0, it may enter the doze state immediately. If the OBO counter decrements to a non-zero value with the random access procedure in a Trigger frame with Cascade Indication field set to 1, it may remain awake for random access in the cascaded Trigger frame.