IEEE P802.11
Wireless LANs

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| Comment Resolution for CID 8142 |
| Date: 2017-03-08 |
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Abstract

This submission proposes resolutions of comments received from TGax comment collection (TGax Draft 1.0).

* CIDs: 8142 (1 CID)

Revisions:

* Rev 0: Initial version of the document.
1. **Introduction**

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. The introduction and the explanation of the proposed changes are 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.***

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| CID | Page Number | Line Number | Comment | Proposed Change | Resolution |
| 8142 | 173 | 1 | The name here and in many places in the document is just "random access" while in other places it is UL OFDMA random access - the second form is clear and unambiguous, but the first form can be confused with normal EDCA random access or DCF random access and should not be used to avoid such confusion. | Define a new name for the UL OFDMA random access process and use it consistently, an acronym is good because it shortens the language and makes for a very convenient name. How about HORA = HE OFDMA Random Access | Revised.Agree in principle with the comment. Proposed resolution accounts for the suggested change.TGax editor to make the changes shown in 11-17/0335r0. |

**Discussion:**

The commenter has made a valid point that just “random access” may be confused with other channel access mechanisms such as EDCA and DCF since they are also considered random access mechanisms. As the commenter suggested, using an appropriate acronym to represent UL OFDMA-based random access would indeed avoid such confusion. However, the acronym suggested by the commenter, HORA, happens to the name of a popular dance in the Balkan as well as many other European countries. As an alternate, **U**L **O**FDMA-based **r**andom **a**ccess (**UORA**) would appear to be a more straightforward choice.

**Propose:**

Revised for CID 8142 per discussion and editing instructions in 11-17/0335r0.

***TGax editor: Insert the following line at the end of 3.4 Abbreviations and acronyms:***

* Abbreviations and acronyms

UORA UL OFDMA-based random access

***TGax editor: Modify the following paragraph of 4.3.14a (High efficiency (HE) STA) as follows:***

* High efficiency (HE) STA

The main MAC features in an HE STA that are not present in VHT STA or non-AP HT STA(#6256) are the following:

* Mandatory support for the basic trigger frame.
* Mandatory support for dynamic fragmentation level 0
* Optional support for Multi-STA BlockAck
* Optional support for target wake up time (TWT) operation
* Optional support for OFDMA-based random access (UORA)

***TGax editor: Modify the title of 27.5.2.6 (UL OFDMA-based random access) as follows:***

* UL OFDMA-based random access (UORA)

***TGax editor: Modify the first two paragraphs of 27.5.2.6.1 (General) as follows:***

* General

A STA shall set the UL OFDMA RA Support subfield in the HE Capabilities element to 1 if it supports ~~UL OFDMA-based random access~~UORA and set it 0, otherwise.

~~UL OFDMA-based random access~~UORA is a mechanism for HE STAs to randomly select resource units (RUs) assigned by an AP in a soliciting Trigger frame that contains RUs for random access. An RU for random access shall be identified by an AID12 subfield equal to 0 contained in a User Info field of a Trigger frame. An HE AP may transmit a Basic Trigger frame or a BSRP Trigger frame that contains one or more RUs for random access.

***TGax editor: Modify 27.5.2.6.2 (Random access procedure) as follows:***

* ~~Random access~~UORA procedure

In this subclause, the ~~random access~~UORA procedure is described with respect to UL OFDMA contention parameters. The procedure is also illustrated in Illustration of the ~~UL OFDMA-based random access~~UORA procedure. The OFDMA contention window (OCW) is an integer with an initial value of OCWmin.

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| * Illustration of the ~~UL OFDMA-based random access~~UORA procedure
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An HE AP indicates the values of OCWmin and OCWmax in the RAPS element in a Beacon or Probe Response frame for the ~~random access~~UORA operation. OCWmax is the upper limit of OCW.

For an initial HE trigger-based PPDU transmission or following a successful HE trigger-based PPDU transmission, when an HE STA obtains the value of OCWmin from the HE AP indicated in the RAPS element, it shall set the value of OCW to the OCWmin and shall initialize its OBO counter to a random value in the range of 0 and OCWmin.

For an HE STA, if the OBO counter is smaller than the number of RUs assigned to AID value 0 in a Trigger frame, then the HE STA shall decrement its OBO counter to zero. Otherwise, the HE STA decrements its OBO counter by a value equal to the number of RUs assigned to AID value 0 in a Trigger frame. For instance, as shown in Illustration of the ~~UL OFDMA-based random access~~UORA procedure, HE STA 1 and HE STA 2 decrement their nonzero OBO counters by 1 in every RU assigned to AID value 0 for random access within the Trigger frame.

For an HE STA, if the OBO counter is 0 or if the OBO counter decrements to 0, then the STA randomly selects one of the RUs assigned to AID value 0If the selected RU is idle as a result of both physical and virtual carrier sensing as defined in subclause **Error! Reference source not found.**, the HE STA transmits its HE trigger-based PPDU in the randomly selected RU. If the selected RU is considered busy as a result of either physical or virtual carrier sensing, then the HE STA shall not transmit its HE trigger-based PPDU in the randomly selected RU and it randomly selects any one of the RUs that are assigned to AID value 0 in the subsequent Trigger frame. If the OBO counter is not zero and does not decrements to 0, the STA resumes with its OBO counter in the next Trigger frame with RUs assigned for random access.

If the HE trigger-based PPDU is successfully transmitted in the randomly selected RU, then the STA shall set its OCW to OCWmin.

NOTE—If the transmitted HE trigger-based PPDU does not solicit an immediate response, then the STA follows the OCW reset rule that applies to successful transmission.

The MU acknowledgment procedure for ~~random access~~UORA follows the procedure as defined in 10.3.2.10.3 (Acknowledgement procedure for an UL MU transmission).

If a STA transmits an HE trigger-based PPDU that solicits an immediate response in a random access RU and the expected response is not received, the transmission is considered unsuccessful and the STA invokes the ~~UL OFDMA-based random access~~ UORA retransmission procedure as defined in Retransmission procedure for ~~random access~~UORA.

***TGax editor: Modify the first paragraphs of 27.5.2.6.3 (Retransmission procedure for random access) as follows:***

* Retransmission procedure for ~~random access~~UORA

If an HE trigger-based PPDU soliciting an immediate response that is sent by a STA in its randomly selected RU (see  ~~Random access~~UORA procedure) fails, then the STA may attempt to retransmit the HE trigger-based PPDU using ~~random access~~UORA. This subclause defines the retransmission procedure that a STA may follow using ~~random access~~UORA.

***TGax editor: Modify 27.14.2 (Power save with UL OFDMA-based random access) as follows:***

* Power save with UL OFDMA-based random access

This subclause illustrates the power save mechanisms for HE STAs using the ~~random access~~UORA procedure (see ~~Random access~~UORA procedure).

An HE AP may indicate one or more start times for Trigger frames with random access allocations in the broadcast TWT element that is included in the Beacon frame or a management frame as described in **Error! Reference source not found.**. The power save operation is shown in Trigger frame (TF) start time in the Beacon frame for power save operation wi with the indication of the start time for a Trigger frame with random access allocations in a Beacon frame.

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| * Trigger frame (TF) start time in the Beacon frame for power save operation with ~~random access~~UORA operation
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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 a value of 2 in the TWT Flow Identifier subfield may enter the doze state until the start of that TWT SP as described in **Error! Reference source not found.**.

If random access allocations are made in 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 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~~UORA 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~~UORA procedure in a Trigger frame with Cascade Indication field set to 1, it may remain awake for random access in the cascaded Trigger frame.