IEEE P802.11
Wireless LANs

|  |
| --- |
| LB266 CR for UORA |
| Date: 2022-09-09 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Greg Geonjung Ko | WILUS Inc. |  |  | greg.ko@wilusgroup.com |
| John (Ju-Hyung) Son |  |  | john.son@wilusgroup.com |
| Sanghyun Kim |  |  | shawn.kim@wilusgroup.com |
| Jin Sam Kwak |  |  | jinsam.kwak@wilusgroup.com |
| Leonardo Lanante | Ofinno |  |  |  |
| Hanqing Lou | InterDigital Inc. |  |  |  |

Abstract

This contribution proposes resolutions for the following CIDs for TGbe LB266:

13550, 13958, 10802, 10957, 12491

12492, 14052, 14050

Revisions:

* Rev 0: Initial version of the document
* Rev 1: Update based on comments from Yanjun, Leonardo and Hanqing

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 TGbe Draft. This introduction is not part of the adopted material.

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

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 13550 | Jian Yu | 9.3.1.22.4 | 156.60 | Enable UORA for EHT variant. | As in comment | RevisedAgree with the comment. The UORA procedure in 11ax is extended to solicit an EHT TB PPDU.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13550. |
| 13958 | Geonjung Ko | 9.3.1.22.4 | 165.36 | Need to define how the RA-RU Information subfield is used for the EHT variant User Info field. | Define a method to indicate RA-RUs in the EHT variant User Info field. | RevisedAgree with the comment. The UORA procedure in 11ax is extended to solicit an EHT TB PPDU.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13958. |
| 10802 | Dong Guk Lim | 9.3.1.22.4 | 165.32 | In the EHT, the RA-RU information is not used. so, the text in P165L32 should be modified by considering the next sentence. | Modify the text from P165L32 to L36 with "The RA-RU Information subfield is reserved in the EHT variant User Info field and Trigger Dependent User Info subfields are set as defined in 9.3.1.22.3 (HE variant User Info field). " | RevisedThis comment is resolved by the resolution of CID 13958.The second sentence regarding the RA-RU Information subfield is removed. The text is added to specify when the RA-RU Information subfield is used.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13958. |
| 10957 | RUI YANG | 9.3.1.22.4 | 165.32 | Here it says "The RA-RU Information ... subfields are set as defined in9.3.1.22.3 (HE variant User Info field).", but in Line 36 of this page, it says "The RA-RU Information subfield is reserved in the EHT variant User Info field." Two sentences appear contradict to each other.. | Change to "In the HE variant User Info field, the RA-RU Information and Trigger Dependent User Info subfields are set as defined in 9.3.1.22.3 (HE variant User Info field)." | RevisedThis comment is resolved by the resolution of CID 13958.The second sentence regarding the RA-RU Information subfield is removed. The text is added to specify when the RA-RU Information subfield is used.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13958. |
| 12491 | Jeongki Kim | 9.3.1.22.4 | 165.32 | According to line 36 on the same page, the RA-RU Information is reserved. The RA-RU Information should be removed in this indicated sentence. | Change the indicated text to " The Trigger Dependent User Info subfield is set as defined in9.3.1.22.3 (HE variant User Info field)." | RevisedThis comment is resolved by the resolution of CID 13958.The second sentence regarding the RA-RU Information subfield is removed. The text is added to specify when the RA-RU Information subfield is used.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13958. |
| 12492 | Jeongki Kim | 9.3.1.22.4 | 165.36 | If the RA-RU Information is not used in the EHT variant User Info field, the "RA-RU Information subfield" need to be removed in the Figure 9-92a. We may also remove this sentence. | As in comment | RevisedThis comment is resolved by the resolution of CID 13958.The second sentence regarding the RA-RU Information subfield is removed. The text is added to specify when the RA-RU Information subfield is used.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13958. |
| 14052 | Yanyi Ding | 9.3.1.22.4 | 165.36 | If the RA-RU Information subfield is reserved in the EHT variant User Info field, why does the previous paragraph say the RA-RU Information and Trigger Dependent User Info subfields are set as defined in 9.3.1.22.3? Kind of confusing here. | Revise to make it clear, is the subfield reserved all the time or under a special condition? | RevisedThis comment is resolved by the resolution of CID 13958.The second sentence regarding the RA-RU Information subfield is removed. The text is added to specify when the RA-RU Information subfield is used.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #13958. |
| 14050 | Yanyi Ding | 9.3.1.22.3 | 155.64 | Many other limitations are not stated clearly here. Add a reference to 26.5.4.2 Eligible RA-RUs for a better understanding. | Insert a bracket at the end of sentence like (see more details in 26.5.4.2 Eligible RA-RUs) | RevisedAdded text for better understanding.TGbe editor, please make changes as shown in 11-22/1565r1 tagged as #14050. |

Discussion:

We have the following text in the SFD:

An AP may allocate an RA-RU to solicit a response in an EHT TB PPDU.

[Motion 135, #SP231, [48] and [312]]

***TGbe editor: Please note that the baseline is 11be D2.1.1 and REVme D1.3.***

**9.3.1.22.4 EHT variant User Info field**

***TGbe editor: Please make the following changes in the 2nd paragraph in subclause 9.3.1.22.4.***

If the AID12 subfield is equal to 2007, the Trigger frame containing this User Info field is generated by an EHT AP, and B55 of the Common Info field of the Trigger frame is equal to 0, then the remaining subfields of the User Info field are defined in 9.3.1.22.5 (Special User Info field). (#13550) If the AID12 subfield is equal to 2043, the User Info field allocates one or more contiguous RA-RUs for associated STAs. If the AID12 subfield is equal to 2044, the User Info field allocates one or more contiguous RA-RUs for unassociated STAs. Otherwise, the AID12 subfield in the EHT variant User Info field is encoded as defined in Table 9-51 (AID12 subfield encoding).

The RU Allocation subfield in an EHT variant User Info field in a Trigger frame that is not an MU-RTS Trigger frame, along with the UL BW subfield in the Common Info field, the UL BW Extension subfield in the Special User Info field, and the PS160 subfield in the EHT variant User Info field, identifies the size and the location of the RU or MRU. The mapping of B7–B1 of the RU Allocation subfield along with the set- tings of B0 of the RU Allocation subfield and PS160 subfield in the EHT variant User Info field are defined in Table 9-53a (Encoding of PS160 and RU Allocation subfields in an EHT variant User Info field), where the bandwidth is obtained from the combination of the UL BW subfield and UL Bandwidth Extension sub-

fields as defined in Table 9-53c (UL Bandwidth Extension subfield encoding) and N is obtained from Table 9-53b (Lookup table for X1 and N) that is derived from Equation (9-0a1).

(#13550) If the AID12 subfield is 2043 or 2044, then the RU Allocation subfield indicates the starting RU of one or more contiguous RA-RUs allocated by the User Info field. If there is more than one RA-RU (i.e., the Number Of RA-RU subfield of this EHT variant User Info field has a value greater than 0), then the allocated RUs are contiguous and the RU sizes of all RA-RUs are the same and equal to the size of the first RU. Further, all the remaining subfields of the EHT variant User Info field apply to all the RA-RUs.

***TGbe editor: Please make the following changes in the following paragraphs starting from P168L1 in subclause 9.3.1.22.4 (#13958).***

(#13958) If the AID12 subfield is either 2043 or 2044, then B26–B31 of the User Info field is the RA-RU Information subfield; otherwise, then B26–B31 of the User Info field is the SS Allocation subfield. The SS Allocation subfield of the EHT variant User Info field indicates the spatial streams of the solicited EHT TB PPDU and the format is defined in Figure 9-92b (SS Allocation subfield format of an EHT variant User Info field).

B26 B29 B30 B31

Number Of Spatial Streams

Starting Spatial Stream

Bits: 4 2

**Figure 9-92b—SS Allocation subfield format of an EHT variant User Info field**

The UL Target Receive Power subfield indicates the expected receive signal power, measured at the AP’s antenna connector and averaged over the antennas, for the EHT portion of the EHT TB PPDU transmitted on the assigned RU and is defined in Table 9-53 (UL Target Receive Power subfield in Trigger frame).

If the size of RU or MRU is smaller than or equal to 2996-tone, then PS160 subfield is set to 0 to indicate that RU or MRU allocation applies to the primary 160 MHz channel and set to 1 to indicate that RU or MRU allocation applies to the secondary 160 MHz channel. Otherwise, the PS160 subfield is used to indicate the RU or MRU index along with the RU Allocation subfield. The PS160 subfield is set as defined in Table 9- 53a (Encoding of PS160 and RU Allocation subfields in an EHT variant User Info field).

The RA-RU Information and Trigger Dependent User Info subfields are set as defined in 9.3.1.22.3 (HE variant User Info field).

**35.5.2.3.2 TXVECTOR parameters for EHT TB PPDU response to Trigger frame**

***TGbe editor: Please make the following changes in the 2nd paragraph in subclause 35.5.2.3.2.***

A non-AP EHT STA that responds to a Trigger frame that solicits an EHT TB PPDU shall set the TXVECTOR parameters below as follows:

* The FORMAT parameter is set to EHT\_TB.
* The L\_LENGTH parameter is set to the value indicated by the UL Length subfield in the Common Info field of the Trigger frame.
* The NUM\_STS parameter is set to the number of spatial streams indicated by the Number Of Spatial Streams subfield of the SS Allocation field of the EHT variant User Info field.
* The STARTING\_STS\_NUM parameter is set to the value of the Starting Spatial Stream subfield in the SS Allocation field in the EHT variant User Info field of the Trigger frame.
* The SPATIAL\_REUSE\_1 and SPATIAL\_REUSE\_2 parameters are set to the values of the respective Spatial Reuse subfields in the Special User Info field of the eliciting Trigger frame.
* The CH\_BANDWIDTH parameter is set to the value of the bandwidth of the EHT TB PPDU, and is obtained from the combined value of the UL BW subfield in the Common Info field and the UL Bandwidth Extension subfield in the Special User Info field (see Table 9-53d (Mapping from Special User Info field to U-SIG-1 and U-SIG-2 fields in the EHT TB PPDU)).
* The RU\_ALLOCATION parameter is set (#13958) as follows:
	+ (#13958) If the RU is not an RA-RU or an RA-RU with the Number Of RA-RU subfield of the User Info field of the Trigger frame set to 0, it is set to the value indicated by the RU Allocation subfield and the PS160 subfield of the User Info subfield of the Trigger frame.
	+ (#13958) If the RU is the *k*th RU of a set of contiguous RA-RUs starting with an RA-RU with Number Of RA-RU subfield of the User Info subfield of the Trigger frame set to a nonzero value, it is set to the value indicated by the RU Allocation subfield and the PS160 subfield of the corresponding User Info subfield of the Trigger frame plus *k* minus 1.
* The TB\_DISREGARD\_IN\_USIG1, TB\_VALIDATE\_IN\_USIG2, and

TB\_DISREGARD\_IN\_USIG2 parameters to the value of the Disregard In U-SIG-1, Validate in U- SIG-2, and Disregard In U-SIG-2 subfields, respectively, in the U-SIG Disregard And Validate subfield in the Special User Info field.

***TGbe editor: Please make the following changes in subclause 35.5.2.2.4.***

**35.5.2.2.4 Allowed settings of the Trigger frame fields and TRS Control subfield**

An EHT AP may transmit a Trigger frame that solicits an EHT TB PPDU from an EHT STA subject to the rules defined in 26.5.2.2 (Rules for soliciting UL MU frames) and the additional rules defined below.

An EHT AP that includes the Special User Info field in a Trigger frame shall set all bits of the Disregard In U-SIG-1 subfield and the four LSBs of the Disregard In U-SIG-2 subfield to 1, if dot11EHTBaseLineFeaturesImplementedOnly is equal to true. The MSB of the Disregard In U-SIG-2 subfield is implementation specific and should be set to 0 if dot11EHTBaseLineFeaturesImplementedOnly is equal to true.

An EHT AP with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not transmit a Trigger frame that solicits both an HE TB PPDU and an EHT TB PPDU. The EHT AP shall not transmit a Trigger frame that contains a User Info field whose AID12 subfield is equal to 0 or 2045 unless both B54 and B55 in the Common Info field of the Trigger frame are equal to 1.

(#13550) The User Info field whose AID12 subfield is equal to 2043 or 2044 shall be an EHT variant User Info field.

***TGbe editor: Please create subclause 35.5.2.5 as follows (#13958).***

**35.5.2.5 EHT UL OFDMA-based random access**

An EHT STA follows the rules defined in 26.5.4 (UL OFDMA-based random access (UORA)) and the additional rules defined below, where rules related to HE TB PPDUs also apply to EHT TB PPDUs.

An EHT AP may send a User Info field including the AID12 subfield set to 0 or 2045 to solicit a response in an HE TB PPDU on an RA-RU that is accessible to both a non-EHT HE STA and an EHT STA. An EHT AP may send a User Info field including the AID12 subfield set to 2043 or 2044 to solicit a response in an EHT TB PPDU on an RA-RU that is accessible to an EHT STA only.

How an AP manages opportunities of a non-EHT HE STA and an EHT STA transmitting on RA-RUs is out of scope of this standard, but when managing the opportunities, the AP is expected to take into account of the fact that the EHT STA may decrease its OBO counter faster than the non-EHT HE STA if the RA-RU is indicated using the AID12 subfield set to 2043 or 2044.

NOTE—For example, an AP might send different OCWmin and OCWmax parameters to a non-EHT HE STA and an EHT STA to control the opportunity to use an RA-RU.

An AP shall not allocate an RA-RU that is an MRU.

An AP allocating a contiguous set of RA-RUs in a Trigger frame with UL BW and UL Bandwidth Extension subfields that indicate 320 MHz shall set the Number Of RA-RUs subfield so that all the RA-RUs in the set lie in one 80 MHz frequency segment.

A STA shall not consider an RA-RU as an eligible RA-RU if the RA-RU is indicated by the User Info field with the AID12 subfield set to 2043 or 2044 in a Trigger frame and the PHY Version Identifier subfield in the Trigger frame indicates a value that the STA does not support.

***TGbe editor: Please make the following changes in the following paragraphs in subclause 26.5.2.2.3.***

**26.5.2.2.3 Padding for a triggering frame**

An AP transmitting a Trigger frame that contains at least one User Info field with AID12 subfield indicating allocation of one or more contiguous RA-RUs for associated STAs shall ensure that the number of bits following the last bit of *SCH* is at least *LPAD,MAC* as defined in Equation (26-1), which is based on the largest *MinTrigProcTime* of all associated non-AP STAs, where *SCH* is the last User Info field with AID12 subfield equal to either 0(#13550) , 2043 or 2046.

An AP transmitting a Trigger frame that contains at least one User Info field with AID12 subfield indicating allocation of one or more contiguous RA-RUs for unassociated non-AP STAs should ensure that the number of bits following the last bit of *SCH* is at least 4 × *NDBPS* for a non-HT PPDU, HT PPDU, or VHT PPDU or *NDBPS* for an HE PPDU, where S*CH* is the last User Info field with AID12 subfield equal to either 2045(#13550), 2044 or 2046.

***TGbe editor: Please make the following changes in the following paragraphs starting from P155L48 in subclause 9.3.1.22.3.***

**9.3.1.22.3 HE variant User Info field**

The RA-RU Information subfield of the User Info field indicates the RA-RU information and the format is defined in [Figure 9-92 (RA-RU Information subfield format)](#bookmark45).

B26 B30 B31

Bits: 5 1

More RA-RU

Number Of RA-RU

**Figure 9-92—RA-RU Information subfield format**

The Number Of RA-RU subfield indicates the number of contiguous RUs allocated for UORA. The value of the Number Of RA-RU subfield is equal to the number of contiguous RA-RUs minus 1. (#14050) A non-AP STA determines an RA-RU indicated by the Number Of RA-RU subfield as an eligible RA-RU as defined in 26.5.4.2 (Eligible RA-RUs) and 35.5.2.5 (EHT UL OFDMA-based random access).