IEEE P802.11  
Wireless LANs

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| D3.0 CR for PHY Misc | | | | |
| Date: 2018-11-12 | | | | |
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Abstract

This submission proposes resolutions for the following comments for TGax D3.0:

* 16067, 16846

Revisions:

* Rev 0: Initial version of the document. Use D3.2 as baseline spec text.
* Rev 1: Add modification on the definition of HE TB PPDU.

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.***

**CID 16067**

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| **CID** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 16067 | Annex AA | 679.04 | There should be an example where non-MU-MIMO RUs are skipped over (i.e. unused) by using STA-ID 2046 | As it says in the comment. | **Revised.**  *TGax Editor*: Please make changes to IEEE P802.11ax D3.2 according to the proposed text changes as resolution to CID 16067 in 11-18/1980r1 |

**Discussions:**

With STA-ID 2046, a non-MU-MIMO RU is unused (not allocated to any STA). However, the HE-SIG-B structure is not changed. There is still a user field for that RU with STA-ID set to 2046 and other fields become not meaningful. So STA-ID 2046 will not bring confusion to the bit sequence of HE-SIG-B. No need to have a example for this case.

Bit order of the HE-SIG-B fields could be the confusion part in the spec D3.2. For example:

In table 28-24: **8 bits indices (B7 B6 B5 B4 B3 B2 B1 B0)**

In table 28-26: B0–B10 STA-ID

It’s easy to misleading people the transmission order are different for different fields. This is because from ax D3.1 to D3.2, all the notes on transmission order of the HE-SIG A&B bits are removed from HE-SIG-A&B tables:

“NOTE—Integer fields are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position.”

Annex AA is the only place talking about LSB first. To make the spec clear, suggest to clarify the preamble bit transmission order somewhere in spec text. The first 2 sentences in Annex AA can also be deleted if the HE-SIG-B bit order are clearly defined in the spec text.

***TGax Editor: please modify ax D3.2 as below as resolution to CID 16067:***

***P479Ln6***

**28.3.10.7 HE-SIG-A**

**28.3.10.7.1 General**

The HE-SIG-A field carries information necessary to interpret HE PPDUs. Integer fields of HE-SIG-A are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position.

***P496Ln34***

**28.3.10.8 HE-SIG-B**

**28.3.10.8.1 General**

The HE-SIG-B field provides the OFDMA and DL MU-MIMO resource allocation information to allow the STAs to look up the corresponding resources to be used in the data portion of the frame. Integer fields of HE-SIG-B are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position.

***P695Ln22***

**Annex AA**

(informative)

**HE-SIG-B content examples**

**AA.1 General**

~~In the following HE-SIG-B examples, unsigned numbers in binary notation are used to represent bit sequences in different fields in HE-SIG-B in the order of transmission. The transmission order is LSB first for all fields in the HE-SIG-B field except for the CRC field, which is MSB first from C7 to C4 as introduced in 28.3.10.7.3 (CRC computation).~~ In ~~the rest of~~ this annex, we are padding 0s as example. And the padding bits are not all included in the HE-SIG-B bit sequence for illustration simplicity. Minimum bits of 0s are padded to make the two HE-SIG-B content channels have equal length and are an integer number of 4 bits. Hexadecimal notation is used to represent the entire content of each HE-SIG-B content channel. The hexadecimal numbers are also in the order of transmission.

**CID 16846**

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| **CID** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 16846 | 3.2 | 38.26 | Starting line 26 on page 38 (section 3.2 definition) " ... HE TB PPDU ... is capable of .... (PSDU) for one or more users" seems conflicting with " ... number of users for an ... or HE TB PPDU is always 1" as stated in the Note of NUM\_USERS in TXVECTOR (Line 55, p. 393). | Please clarify and update accordingly if agreed. | **Revised.**  *TGax Editor*: Please make changes to IEEE P802.11ax D3.2 according to the proposed text changes as resolution to CID 16846 in 11-18/1980r1 |

**Discussions:**

This is a resolved comment with original resolution shown below:

Rejected.   
There is no conflict. From the TXVECTOR point of view it is only one user.

The resolution is ok, but there are some problems with the definition of NUM\_USERS in TXVECTOR/RXVECTOR.

In D3.2 pp419ln28, it says: “MU indicates that the parameter is present once for an HE SU PPDU and HE ER SU PPDU and present per user for an HE MU PPDU. For an HE TB PPDU, MU in the TXVECTOR column indicates that the parameter is present once and MU in the RXVECTOR column indicates the parameter is present per user. Parameters specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to NUM\_USERS - 1.”

However, “NUM\_USERS” are defined as below and is always 1 for HE TB PPDU:



This definition is correct for TXVECTOR but not for RXVECTOR.

The following fields in RXVECTOR are defined as MU:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| … | … | … | … | … |
| FEC\_CODING | FORMAT is HE\_SU, HE\_MU, HE\_ER\_SU or HE\_TB | Indicates which FEC encoding is used. Enumerated type: BCC\_CODING indicates binary convolutional code. LDPC\_CODING indicates low-density parity check code. | MU | MU |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters). | | |
| … | … | … | … | … |
| MCS | FORMAT is HE\_SU, HE\_MU, HE\_ER\_SU or HE\_TB | Indicates the modulation and coding schemes used in the transmission of the PPDU. Integer: range 0 to 11 | MU | MU |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters). | | |
| DCM | FORMAT is HE\_SU, HE\_MU, HE\_ER\_SU or HE\_TB | Set to 1 to indicate that DCM is used for the Data field(#16032). Set to 0 to indicate that DCM is not used for the Data field(#16032). NOTE—DCM is applied only to HE-MCSs 0, 1, 3 and 4. DCM is applied only to 1 and 2 spatial streams. DCM is not applied to MU-MIMO. DCM is not applied in combination with STBC.(#15490) | MU | MU |
| Otherwise | Not present. | | |
| … | … | … | … | … |
| NUM\_STS | … | … |  |  |
| FORMAT is HE\_TB | Indicates the number of space-time streams. Integer in the range: 1-4 for a MU-MIMO RU in the TXVECTOR 1-4 per user per MU-MIMO RU in the RXVECTOR 1-8 for an RU assigned to no more than 1 user in the TXVECTOR and RXVECTOR NUM\_STS summed over all users per RU is not greater than 8. | MU | MU |
| … | … |  |  |
| … | … | … | … | … |

For HE\_TB format, these 4 fields are not needed in RXVECTOR since all these parameters are selected by RX(AP) so RX MAC already have the value of these parameters.

Resolution options:

Option 1: Separately define these parameters for HE\_TB format and change RXVECTOR of these parameters for HE\_TB format to N.

Option 2: Change the definition of MU for RXVECTOR of HE\_TB format to not present.

Option 2 is cleaner.

***TGax Editor: please modify ax D3.2 as below as resolution to CID 16846:***

***P38Ln26***

**high efficiency (HE) trigger-based (TB) physical layer protocol data unit (PPDU):** An HE PPDU transmitted with HE TB PPDU format, sent in response to a frame containing TRS control field or a trigger frame. ~~that is capable of carrying one or more PHY service data units (PSDU) for one or more users.~~

***P404Ln28, P406Ln32, P406Ln40, P410Ln35***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| … | … | … | … | … |
| NUM\_STS | … | … |  |  |
| FORMAT is HE\_TB | Indicates the number of space-time streams. Integer in the range: 1-4 for a MU-MIMO RU in the TXVECTOR 1-4 per user per MU-MIMO RU in the RXVECTOR 1-8 for an RU assigned to no more than 1 user in the TXVECTOR and RXVECTOR NUM\_STS summed over all users per RU is not greater than 8. | ~~MU~~ Y | ~~MU~~ N |
| … | … |  |  |
| … | … | … | … | … |
| NOTE 1—In the “TXVECTOR” and “RXVECTOR” columns, the following apply:  Y = Present;  N = Not present;  O = Optional;  MU indicates that the parameter is present once for an HE SU PPDU and HE ER SU PPDU and present per user for an HE MU PPDU. For an HE TB PPDU, MU in the TXVECTOR column indicates that the parameter is present once and MU in the RXVECTOR column indicates the parameter is not present ~~per user~~. Parameters specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to NUM\_USERS - 1. | | | | |