IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comment Resolutions for xVECTORs | | | | |
| Date: 2018-10-12 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Bo Sun | ZTE | ZTE R&D center, #9 Wuxingduan, Xifeng Rd., Chang’an district, Xi’an, China | +86-29-68700944 | Sun.bo1@zte.com.cn |
|  |  |  |  |  |

Abstract

This submission provisions with resolutions to the following 31 CIDs for sub-clause 28.2.1 (Introduction), 28.2.2 (TXVECTOR and RXVECTOR parameters) and 28.2.3 (TRIGVECTOR parameters) of TGax D3.0, including suggested spec text modification to IEEE P802.11ax D3.2 to TGax editor:

* CIDs:16779, 16989, 16229, 16348, 17128, 16990, 16830, 15967, 15801, 16600, 16349, 16262, 16829, 16134, 16051, 16635, 16855
* CIDs: 15951, 16065, 16306, 16778, 16834
* CIDs: 16828, 16736, 16831, 15969, 16004, 16780, 16781, 16782, 16784

Revisions:

* R0, comment resolutions initial draft.
* R1, change the CID number from 22 to 31 in the Abstract section

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** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 16778 | 28.2.1 | 383.20 | "The interface includes TXVECTOR, RXVECTOR, and PHYCONFIG\_VECTOR.". TRIG\_VECTOR is also defined in this section, but omitted from the list. | Mention TRIG\_VECTOR in this introduction | **Revised**  Agree in principle  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16778 in 11-18/1759r1. |
| 16828 | 28.2.1 | 383.20 | Need to include the new item TRIGVECTOR to the introduction section. | Add TRIGVECTOR to the inclusion list and a brief intro statement in the next paragraph. | **Revised**  Agree in principle  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16778 in 11-18/16828r0. |
| 16779 | 28.2.2 | 384.46 | "Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 28.3.15.2". Feedback matrices are input to the calculation of the expansion matrix, but need not be the same.  Same comment on line 53. | Replace "feedback matrices" with "spatial mapping matrices". | **Rejected**  Reason: the parameter EXPANSION\_MAT is used to transfer “feedback matrices” as the input to calculate the spatial mapping/steering matrix Q. |
| 16736 | 28.2.2 | 384.48 | Define 'HE Training Symbols" when it is first introduced | Change "HE Training Symbols" to "HE Training Symbols, which include HE-STF and HE-LTF," | **Rejected**  Reason: the issue addressed by the comment doesn’t exist in 11ax D3.0. |
| 16989 | 28.2.2 | 387.19 | "In an HE MU PPDU and HE TB PPDU where each RU includes no more than 1 user: Set to 1 to indicate that for all RUs the Data field is STBC encoded Set to 0 to indicate that in no RU is the Data field STBC encoded.  In an HE SU PPDU, HE ER SU PPDU or HE TB PPDU: Set to 1 to indicate that the Data field is STBC encoded Set to 0 to indicate that the Data field is not STBC encoded.  If at least one of the following conditions is satisfied, STBC is set to 0: -- FORMAT is HE\_MU or HE\_TB, and RU\_ALLOCATION value indicates two or more users in one RU".  The descriptions are confusing to interpret for HE\_TB PPDU. Remove "or HE TB PPDU" from "In an HE SU PPDU, HE ER SU PPDU or HE TB PPDU". | As in comment. | **Revised**  Agree in principle.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16989 in 11-18/1759r1 |
| 16229 | 28.2.2 | 387.27 | "Nss value is larger than 1" -- there is no Nss parameter in the \*XVECTORs | Change to "NUM\_STS" | **Accepted** |
| 16348 | 28.2.2 | 387.49 | "numberOfOctets" is not a defined operator | Define this operator | **Rejected**  Reason: numberOfOctets is clear as it says. |
| 16780 | 28.2.2 | 390.20 | Enumerated formats are ususally indicated with a name and a brief explanation (see other instances of enumerated type in Table 28-1). | Provide a name for the two enumerated modes | **Revised**  Agree in principle.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16780 in 11-18/1759r1 |
| 17128 | 28.2.2 | 390.31 | For the CH\_BANDWIDTH of HE MU, althrough there is bandwidth indication of preamble puncture modes, but there are only 4 types (same as BW indication in HE SIG A field), the indication has ambiguity. As a result, the PHY layer can not clearly know which 20MHz sub-channels in S40 and S80 are punctured for some type. | Propose to clearly indicate each 20MHz sub-channel is punctured or not. E.g. add a bitmap for preamble puncture modes. | **Revised**  Discuss: the transmitter’s MAC has to inform its PHY which 20 MHz sub-channels are punctured, even there could be no RU allocated for data part on those 20 MHz sub-channels.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 17128 in 11-18/1759r1 |
| 16990 | 28.2.2 | 393.13 | Table 28-1--TXVECTOR and RXVECTOR parameters , RU\_ALLOCATION description, "8 bits for 20 MHz and 40 MHz PPDU; 16 bits for 80 MHz PPDU; 32 bits for 160 MHz and 80+80 MHz PPDU.". According to structure of common field of HE-SIG-B, each HE-SIG-B content channel contains 8 bits RU\_ALLOCATION for 40MHz PPDU, each HE-SIG-B content channel contains 16 bits RU\_ALLOCATION for 80MHz PPDU, each HE-SIG-B content channel contains 32 bits RU\_ALLOCATION for 160MHz and 80+80MHz PPDU. Why TXVECTOR RU\_ALLOCATION only counts the number of bits in one HE-SIG-B content channel? | Change to , "8 bits for 20 MHz PPDU; 16 bits for 40 MHz PPDU; 32 bits for 80 MHz PPDU; 64 bits for 160 MHz and 80+80 MHz PPDU." | **Revised.**  Agree in principle. The commented issue is actually at pg394/ln13.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16990 in 11-18/1759r1 |
| 16830 | 28.2.2 | 393.55 | NUM\_USERS in TXVECTOR is not used in HE. Instead, it is noted that the number of users for an HE MU PPDU is determined by RU\_ALLOCATION. Is it an accurate note? According to sec 27.11.1, some RU (when STA ID = 2046) may carry no user. | Update the note if agreed and also include how to figure out NUM\_USERS from other parameters in TXVECTOR. | **Revised.**  Agree in principle. For an HE MU PPDU, the number of users is RU\_ALLOCATION with consideration of the STA\_ID\_LIST element for that RU.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16830 in 11-18/1759r1 |
| 16781 | 28.2.2 | 394.14 | "8 bits for 20 MHz and 40 MHz PPDU;  16 bits for 80 MHz PPDU;  32 bits for 160 MHz and 80+80 MHz PPDU."  This is the number of bits per content channel. This would not cover the total BW for 40, 80 and 160 MHz. | Correct the number of bits | **Revised.**  Agree in principle.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16781 in 11-18/1759r1 |
| 16831 | 28.2.2 | 395.00 | The second 1x, 2x, 4x in the respective line seems unnecessary. | Remove them if agreed. For example, change from "1xHE-LTF indicates a 1xHE-LTF for 12.8 us with 0.8 us or 1.6 us" to "1xHE-LTF indicates a HE-LTF for 12.8 us with 0.8 us or 3.2 us GI," and the like. | **Revised.**  Agree in principle. The addressed text need to be refined. And sub-clause 28.3.8 (Timing related parameters) doesn’t define 1x HE-LTF, 2x HE-LTF or 4x HE-LTF. Instead, they are defined in sub-clause 28.3.10.10 (HE LTF).  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16831 in 11-18/1759r1 |
| 15969 | 28.2.2 | 395.40 | "a 1x HE-LTF for 3.2 us" is confusing. Should always use the <n>x notation | Delete " for 3.2 us", " for 6.4 us" and " for 12.8 us" in Table 28-1 | **Revised**  Agree in principle.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 15969 in 11-18/1759r1 |
| 16782 | 28.2.2 | 395.40 | "1x HE-LTF for 3.2 ╬╝s". By definition, 1x HE-LTF means 3.2 usec. | Delete " for 3.2 ╬╝s". Similar for 2xHE-LTF and 4xHE-LTF. | **Revised**  Agree in principle.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16782 in 11-18/1759r1 |
| 15967 | 28.2.2 | 395.53 | "It is only present for full bandwidth MU-MIMO not using 1x HE-LTF" -- in that case it's optional | Change "Y" to "O" at the referenced location | **Accepted** |
| 15801 | 28.2.2 | 396.50 | An FTM management frame used for management signaling does not make use of ToD/ToA. An FTM used for measurement cannot use any of the HE formats as this will make existing 802.11-2016 STAs non-standard compliant. | Remove TIME\_DEPARTURE from table 28-1 | **Rejected.**  Reason: The parameter “TIME\_OF\_DEPARTURE\_REQUEST” is “optional” for TXVECTOR and the use of this parameter is under implementation consideration. |
| 16600 | 28.2.2 | 396.51 | The entry for "TIME\_OF\_DEPARTURE\_RE" suggests that we will have FTM in HE format, which will have the following issues. 1. It is not backward compatible with REVmc STAs (something which is contradicting to the TGaz PAR and CSD), Essentially it will create no 2. The longer symbol time of HE format is expected to increase medium usage, which is already a problem of REVmc FTM, 11az mitigate this by using NDP with shorter symbol time from data HE PPDU. REVmc FTM uses long management frames for sounding purposes. 3. There is no (range accuracy) performance advantage of using HE format (because REVmc FTM already supports all BWs), the performance is expected to somewhat degrade due to larger number of guard SC. 4. Developing a new FTM mode in 11ax is clearly conflicting to the 11ax and 11az charters - the work is already well in progress in 11az. The WG can decide to modify the 11ax PAR to include FTM, however till then, 11az should allow to continue its work without interference from other TG. 5. Developing an 11ax variant of FTM will create market confusion because 11az STAs are developing the HE support for FTM already well in progress. | Remove the cited entry in TXVECTOR and RXVECTOR table. Bring the discussion to 11az group to make sure that HE design can be harmonized without conflicting with 11az design. | **Rejected.**  Reason: 11ax is based on amendment of 802.11-2016 and support to 11az is not the prerequisite. And the parameter “TIME\_OF\_DEPARTURE\_REQUEST” is “optional” for TXVECTOR which means the use of this parameter is under implementation consideration. |
| 16004 | 28.2.2 | 397.32 | "If the PPDU contains at least one MPDU whose RA field is broadcast group address, then the value of NOMINAL\_PACKET\_PADDING is 16 us." -- this should not be buried in the TXVECTOR table | Delete the cited text at the referenced location and insert it at the end of Subclause 28.3.12 | **Revised**  Agree in principle. The statement of how to set a TXVECTOR parameter should be included in the function description section. And the Nominal Packet Padding value is not defined or referred in 9.4.2.237.5 (PPE Thresholds field).  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16004 in 11-18/1759r1 |
| 16349 | 28.2.2 | 397.51 | It's a bit obscure that the PE in the basic trigger case isn't the default, it's fully specified by a combination of trigger fields and well hidden bits of the standard, but for the TRS case you need a TXVECTOR parameter for the default | Make both cases or neither take a TXVECTOR parameter for the PE | **Rejected**  **Reason**: the spec text addressed by this comment has been discussed during the resolution to CID 9490 in cr document 11-17/0465r8 and consensus was reached in the group. |
| 16262 | 28.2.2 | 397.56 | PE\_DURATION and DEFAULT\_PE\_DURATION are enumerated types with enumeration values, but these enumerated values are not used anywhere, and wording like " with the duration TPE equal to the value specified in the TXVECTOR parameter DEFAULT\_PE\_DURATION." is not clear, since an enumeration value is not a duration | Change to an integer type, with allowed values 0, 4, 8, 12, 16 us | **Revised.**  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16262 in 11-18/1759r1 |
| 16829 | 28.2.2 | 398.00 | What's the format of STA\_ID\_LIST? How is it associated with the RUs in RU\_ALLOCATION? | Please update if agreed. | **Rejected.**  Reason: details of STD\_ID\_LIST and how it is used is specifically defined in section 27.11.1 STD\_ID\_LIST |
| 16134 | 28.2.2 | 398.39 | "Set to 1 if the HE PPDU is addressed to an AP. Set to 0 otherwise" -- 0 can be used even if it is addressed to an AP; see 27.11.2 | Change to "Set to 1 if the HE PPDU is addressed to an AP, except as indicated in 27.11.2. Set to 0 if the HE PPDU is not addressed to an AP, except as indicated in 27.11.2" | **Accepted.**  Agree with the comment. The exception has been explained in details in section 27.11.2. |
| 16051 | 28.2.2 | 398.51 | It is not clear why the SCRAMBLER\_INITIALIZATION\_VALUE does not optionally need to be present in non-non-HT formats, since nothing stops an MU-RTS from being sent in a non-non-HT PPDU, e.g. an HE SU PPDU (the only restriction I can find is "An MU-RTS Trigger frame shall not be carried in a VHT MU PPDU or an HE MU PPDU." at the end of 27.2.5.2) | Delete the "FORMAT is NON\_HT" at the referenced row and delete the cells from "Otherwise" to the right in the row below | **Revised.**  **Discussion:** The parameter SCRAMBLER\_INITIALIZATION\_VALUE was first introduced in 11ax D0.3 as proposed by 11-16/0815r2 as part of resolution to CID 127. And the spec text for this parameter stays unchanged until in 11ax D3.0. There’s no evidence to show why the parameter value for the situation “Otherwise” was changed from “*Indicates the Scrambler Initialization value in the Service field, prior to descrambling*” to “*Not present*”.  **TGax Editor:**  please implement the proposed text changes to 802.11ax D3.2 for CID 16051 in 11-18/1759r1 |
| 16635 | 28.2.2 | 400.27 | HE\_TB\_PE\_DISAMBIGUITY is incorrectly described. "1 indicates PE disambiguity" is incorrect; rather HE\_TB\_PE\_DISAMBIGUITY, whether it be 0 or 1, is used to disambiguate how many OFDM symbols there are in the Data field. | Describe as "Indicates PE Disambiguity as defined in 28.3.12 (Packet extension).". Ditto P402L12 | **Rejected.**  The value of parameter HE\_TB\_PE\_DISAMBIGUITY comes from the PE Disambiguity subfield of the UL Packet Extension subfield in the Common Info field in the Trigger frame. Therefore it follows the same interpretation of PE Disambiguity subfield. |
| 16834 | 28.2.3 | 401.9 | It seems the parameters in Table 28-2 is a subset of Table 28-1. Can PHY assume the parameters in Table 28-2 have been ported to Table 28-1 properly by MAC when FORMAT is HE TB? If not, how is the consistency quaranteed? | Please clarify. | **Rejected**  The parameters contained in Table 28-1 is used for current transmitting or receiving. While the parameters in Table 28-2 serves for the next receiving of HE TB PPDU. The comment is more like a question rather than a change request. |
| 15951 | 28.2.3 | 401.33 | The MU-MIMO LTF mode does not apply if OFDMA is also being used | In Table 8-4 and Table 28-2 after "that is not using 1x HE-LTF" append "and is not using OFDMA". In 9.3.1.23 prepend "and is not using OFDMA, " before "in which case the MU-MIMO LTF Mode subfield is" | **Revised**  Agree in principle. The intention of the original text is to exclude the OFDMA case. A better description is similar to the corresponding parameter as in Table 28-1.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 15951 in 11-18/1759r1 |
| 16065 | 28.2.3 | 401.37 | There is no need to have obscurely encoded mushed-up fields in a \*VECTOR | Change "NUMBER\_OF\_HELTF\_SYMBOLS\_AND\_MIDAMBLE\_PERIODICITY" to two parameters, NUMBER\_OF\_HELTF\_SYMBOLS and MIDAMBLE\_PERIODICITY. The latter is only present if DOPPLER is set to 1 and has possible values 10 and 20. The former can take values 1, 2, 4, 6 or 8 if DOPPLER is set to 0 and 1, 2, 4 if DOPPLER is set to 1 | **Rejected**  **Reason:** there’re different opinions on the principle of using combined field or not. Since there’s no obvious benefit to choose another one, it’s preferred to keep the current format. |
| 16784 | 28.2.3 | 402.17 | "Set to 1 to indicate that midambles are present.". For consistency with other rows, change to "Set to 1 to indicate that midambles are present in the expected HE TB PPDU". | See comment | **Revised**  Agree in principle.  **TGax Editor:** please implement the proposed text changes to 802.11ax D3.2 for CID 16784 in 11-18/1759r1 |
| 16306 | 28.2.3 |  | There are various issues with the TRIGVECTOR material | I will supply an annotated version of 18/0823 | **Rejected**  Reason: the comment fails to provide an implementable modification proposal. |
| 16855 | 28.2.10.10 | 496.44 | Can a user be assigned to two different RUs? Depending on the answer, the phrase " ... in an HE TB PPDU with more than one RU" may conflict 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. | **Rejected**  **Reason**: the addressed sentence doesn’t imply that one user can be assigned with two or more RU. |

*---------------------------Proposed Spec Text Modifications----------------------------------*

***TGax Editor: please modify the sub-clause 28.2.1 Introduction as proposed below as resolution to CID 16778/16828-----------***

**28.2 HE PHY service interface**

**28.2.1 Introduction**

The PHY provides an interface to the MAC through an extension of the generic PHY service interface defined in 8.3.4 (Basic service and options). The interface includes TXVECTOR, RXVETOR, ~~and~~ PHYCONFIG\_VECTOR and TRIG\_VECTOR.

Using the TXVECTOR, the MAC supplies the PHY with per-PPDU transmit parameters. Using the RXVECTOR, the PHY informs the MAC of the received PPDU parameters. Using the PHYCONFIG\_VECTOR, the MAC configures the PHY for operation, independent of frame transmission or reception. Using the TRIG\_VECTOR, the MAC of an HE AP configures its PHY to receive HE TB PPDU over each assigned RU.*[CID #16778/16828]*

***-----------------------End of proposed changes as resolution to CID 16778/16828---------------------------------------***

***TGax Editor: please modify the Table 28-1 – TXVECTOR and RXVECTOR parameters from page 405 line 19 in IEEE P802.11ax D3.2 as proposed below as resolution to CID 16989/16780/16990/16830/16781/16004/16262/15951/16784/16051.***

Table 28-1 – TXVECTOR and RXVECTOR parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| **…** | **…** | **…** | **…** | **…** |
| STBC | FORMAT is HE\_SU, HE\_MU, HE\_EXT\_SU or HE\_TB | Indicates if STBC is used.  In an HE MU PPDU and HE TB PPDU where each RU includes no more than 1user:  Set to 1 to indicate that all RUs are STBC encoded in the Data field  Set to 0 to indicate that no RU is STBC encoded in the Data field  In an HE SU PPDU~~,~~ or HE ER SU PPDU ~~or HE TB PPDU~~:  Set to 1 to indicate that STBC is used in the Data field  Set to 0 to indicate that STBC is not used in the Data field  If at least one of the following conditions is satisfied, STBC is set to 0:  -- FORMAT is HE\_MU or HE\_TRIG, and RU\_ALLOCATION value indicates two or more users in one RU;  -- Nss value is larger than 1;  -- DCM value is True;  *[CID16989]* | Y | Y |
| Otherwise | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) or Table 21-1 (TXVECTOR and RXVECTOR parameters). | | |
| … | … | … | … | … |
| CH\_BANDWIDTH | … | … | … | … |
| FORMAT is HE\_ER\_SU | Indicates the channel width of the PPDU.  Enumerated type:  ER-RU-242 for 242-tone RU within the primary 20 MHz  ER-RU-H-106 for ~~H~~higher frequency 106-tone RU within the primary 20 MHz *[CID #16780]* | Y | Y |
| …. | … | … | … |
| … | … | … | … |
| … | … | | |
| PREAMBLE\_PUNCTURING\_BITMAP  *[CID #17128]* | FORMAT is HE\_MU and CH\_BANDWIDTH is any value for preamble puncturing | Indicates which 20 MHz sub-channels are punctured or not.  A bitmap indicating each 20 MHz sub-channel in ascending order with the LSB bit indicating the lowest 20 MHz sub-channel. And each bit of the bitmap is:  set to 1 to indicate the corresponding 20 MHz sub-channel is punctured;  set to 0 to indicate the corresponding 20 MHz sub-channel is not punctured. | Y | N |
| Otherwise | Not present | N | N |
|  |  |  |  |  |
|  |  |  |  |  |
| NUM\_USERS | FORMAT is HE\_SU, HE\_MU, HE\_ER\_SU or HE\_TB | Not present.  NOTE—number of users for an HE SU PPDU, HE ER SU PPDU or HE TB PPDU is always 1. The number of users in a RU for an HE MU PPDU is determined by RU\_ALLOCATION and STA\_ID\_LIST element for that RU.*[CID #16830]* | N | N |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters) | | |
| RU\_ALLOCATION | FORMAT is HE\_MU and SIG\_B\_COMPRESSION\_MODE is 0 | For the TXVECTOR, indicates the RU Allocation subfield of Common field in the HE-SIG-B of the transmitted PPDU.  8 bits for 20 MHz ~~and 40 MHz~~ PPDU;  16 bits for 40~~80~~ MHz PPDU;  32 bits for 80~~160~~ MHz ~~and 80+80 MHz~~ PPDU;~~.~~  64 bits for 160 MHz and 80+80 MHz PPDU.  *[CID #16781/16990]*  See 28.3.10.8.5 (HE-SIG-B common content) for details.  For the RXVECTOR, 8 bits are used to indicate the RU allocated in the whole bandwidth.  See 9.3.1.23 (Trigger frame format) for details. | Y | Y |
| … | …. | … | … |
| … | …. | … | … |
| … | … | … | … | … |
| HE\_LTF\_TYPE | FORMAT is HE\_SU, HE\_MU, HE\_ER\_SU or HE\_TB | Indicates the type of HE-LTF. Enumerated type:  1xHE-LTF indicates a 1x HE-LTF ~~for 3.2 µs with 0.8 µs or 1.6 µs GI~~  2xHE-LTF indicates a 2x HE-LTF ~~for 6.4 µs with 0.8 µs or 1.6 µs GI~~  4xHE-LTF indicates a 4x HE-LTF ~~for 12.8 µs with 0.8 µs or 3.2 µs GI~~  See ~~28.3.8 (Timing-related parameters) and~~ 28.3.10.10 (HE LTF).  *[CID #16831/15969/16782]* | Y | Y |
| Otherwise | Not present | N | N |
|  |  |  |  |  |
|  |  |  |  |  |
| NORMAL\_PACKET\_PADDING | FORMAT is HE\_SU, HE\_MU, or HE\_ER\_SU | Indicates the~~The~~ Nominal Packet Padding value used to calculate the duration of PE field as defined in 28.3.12 (Packet extension) ~~as defined in 9.4.2.237.5 (PPE Thresholds field)~~.  Possible values are 0 µs, 8 µs and 16 µs.  ~~If the PPDU contains at least one MPDU whose RA field is broadcast group address, then the value of NOMINAL\_PACKET\_PADDING is 16 µs.~~  *[CID #16004]* | Y | N |
| Otherwise | Not present | N | N |
| … | … | … | … | … |
| DEFAULT\_PE\_DURATION | FORMAT is HE\_TB and TRIGGER\_METHOD is TRS | Duration of the PE field to be transmitted (see 27.5.3.3 (STA behavior for UL MU operation)).Possible values are:  0 for 0 us;  4 for 4 us;  8 for 8 us;  12 for 12 us;  16 for 16 us.  ~~Enumerated type:~~  ~~PE0 for 0 us~~  ~~PE1 for 4 us~~  ~~PE2 for 8 us~~  ~~PE3 for 12 us~~  ~~PE4 for 16 us~~  *[CID #16262]* | Y | N |
| Otherwise | Not present | N | N |
| … | … | … | … | … |
| SCRAMBLER\_INI TIAL\_VALUE | FORMAT is NON\_HT | In TXVECTOR, if present, indicates the value of the Scrambler Initialization field in the SERVICE field, after scrambling.  In RXVECTOR, indicates the value of the Scrambler Initialization field in the SERVICE field, prior to descrambling. | O | Y |
| FORMAT is HE\_MU or HE\_TB | Not present | N | N |
| FORMAT is VHT and GROUP\_ID is not 0 or 63 | Not present | N | N |
| Otherwise | ~~Not present~~ Indicates the value of the Scrambler Initialization field in the SERVICE field, prior to descrambling.  *[CID #16051]* | N | ~~N~~Y |
|  |  |  |  |  |
| 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 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  NOTE 2 – Refer to Clause 15, 16, 17, 18, 19 and 21 for the TXVECTOR/RXVECTOR parameters that are not present in this table when FORMAT is not HE\_SU, HE\_MU, HE\_EXT\_SU or HE\_TRIG. | | | | |

**28.2.3 TRIGVECTOR parameters**

The TRIGVECTOR is carried in a PHY-TRIGGER.request primitive for PHY of AP to receive HE TB PPDU over each assigned RU. The parameters in Table 28-2 (TRIGVECTOR parameters) are defined as part of the TRIGVECTOR parameter list in the PHY-TRIGGER.request primitive

**Table 28-2 – TRIGVECTOR parameters**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| …… | …… |
| MU-MIMO LTF MODE | Indicates the LTF mode of the expected UL MU-MIMO HE TB PPDU that uses full bandwidth MU-MIMO and is not using 1x HE-LTF. *[CID #15951]*  Set to 0 to indicate that HE single stream pilot HE-LTF mode is used.  Set to 1 to indicate that HE masked HE-LTF sequence mode is used |
| … | … |
| DOPPLER | Indicates a high Doppler mode of ~~transmission~~the expected HE TB PPDU. *[CID #16784]* Set to 1 to indicate that midambles are present. Set to 0 otherwise |
| … | … |

--- ***End of proposed changes as part of resolution to CID CID 16989/16780/16990/16830/16781/16004/16262/15951/16784/16051***-----

**References:**

1. **IEEE P802.11axTM/D1.0, Nov 2016.**
2. **IEEE P802.11axTM/D2.0, Jun 2017**
3. **IEEE P802.11axTM/D2.1, Jan 2018**