IEEE P802.11
Wireless LANs

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| Comment Resolutions for 11ax D5.0 HE PHY Service Interface Section  |
| Date: 2019-03-10 |
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Abstract

This submission provisions with resolutions to the following 17 CIDs for sub-clause 27.2.2 (TXVECTOR and RXVECTOR parameters), 27.2.3 (TRIGVECTOR parameters) and 27.2.4 (PHYCONFIG\_VECTOR parameters) of IEEE P802.11ax D5.0, including suggested spec text modification to IEEE P802.11ax D5.0 to TGax editor:

* CIDs: 22029, 22162, 22210, 22295, 22382, 22383, 22415, 22418, 22458, 22459, 22554

Revisions:

* R0, comment resolutions initial draft.
* R1, correct typos in the discussion of CID 22295
* R2, update the proposed modification as part of resolution to CID 22554; change resolution to CID 22458

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.***

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| **CID** | **Pg/Ln** | **Clause** | **Comment** | **Proposed Changed** | **Resolution** |
| 22029 | 545.5 | 27.3.10.5 | aSignalExtension definition refers to Table 19-25, but that only defines aSignalExtension for 2.4 and 5 GHz (i.e. not 6 GHz) | Insert Table 19-25 into this draft and change "0μs when operating in the 5 GHz band" to "0μs when operating other than in the 2.4 GHz band" | **Revised****Discussion:** Agree on the issue addressed by the comment. While the referred parameter aSignalExtension in sub-clause 27 should be re-defined in Table 27-55, instead of modifying the same parameter in Table 19-25.**Instruction to TGax Tech Editor:** Please implement the proposed modification to 11ax spec draft D5.0 as part of the resolution to CID 22029 as in 11-19/1896r1. |

*---------------------------****Proposed Spec Text Modifications for CID 22029****----------------------------------*

***TGax Editor: please modify the definition of parameter SignalExtension at pg545/ln05 in sub-clause 27.4.4 in IEEE P802.11ax D5.0 as proposed below as part of resolution to CID 22029.***

**27.3.10.5 L-SIG**

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*SignalExtension* is 0 us if the TXVECTOR parameter NO\_SIG\_EXTN is true and is aSignalExtension as
defined in Table ~~19-25~~ 27-55 (~~HT~~HE PHY characteristics) if the TXVECTOR parameter NO\_SIG\_EXTN is false *[CID # 22029]*

***TGax Editor: please add a new raw for parameter aSignalExtension in Table 27-55 – HE PHY characteristics at pg678/ln17 in IEEE P802.11ax D5.0 as proposed below as part of resolution to CID 22029.***

**27.4.4 HE PHY**

**……**

**Table 27-55—HE PHY characteristics**

|  |  |
| --- | --- |
| **Characteristics** | **Value** |
| aRxPHYDelay | Implementation dependent |
| aSignalExtension | 0μs when operating in the 5 GHz or above band 6μs when operating in the 2.4 GHz band*[CID # 22029]* |
| aCCAMidTime | Implementation dependent |
| … | … |

-------------------- ***End of proposed changes for resolution to CID 22029*** ------------------------

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| **CID** | **Pg/Ln** | **Clause** | **Comment** | **Proposed Changed** | **Resolution** |
| 22162 | 487.10 | 27.2.3 | Many of the parameters of Table 27-2--TRIGVECTOR parameters don't actually seem to have any behaviour associated with them (e.g. HE\_MCS\_LIST, UL\_DCM\_LIST) | Associate some behaviour to each of the parameters. | **Rejected****Reason:** The comment is not correct. There’re notes for each of the commented parameter for detailed explanation of behavior in consistence with corresponding fields in a Trigger frame.  |
| 22210 | 27.2.2 | 482.43 | CID 20477: again, the concept of "global" numbering of spatial streams is undefined | Delete "globally " in "spatial streams are globally numbered starting from 1" in the referenced subclause | **Rejected.****Reason:** The word ‘globally’ is well defined.**Discussion:** The sentence “spatial streams are globally numbered” implies that the spatial streams are numbered by AP uniquely mapping to the CSD offset. Texts below supports the above definition as in 11ax D5.0: 1. For HE TB PPDU response to trigger frame, STARTING\_ STS\_ N UM is set to the value of 3-bit Starting Spatial Stream subfield of SS allocation subfield in user field of trigger frame, which indicates the starting spatial stream of the current triggered user and is set to the starting stream number minus 1.
2. Similarly, for HE TB PPDU response to TRS control subfield and NFRP trigger frame, the STARTING\_ STS\_ NUM is respectively set to 0 and STARTING\_STS\_NUM = (AID – Starting AID) / 18 / 2BW

Please Refer to subclause 26.5.2.3.3, 26.5.2.3.4 and 26.5.7.2 for more details. |
| 22295 | 488.19 | 27.2.3 | The AID12 in the Trigger frame can only contain values up to 2007 when identifying one or more STAs, so the AID12\_LIST actually is a list of AID11s | In Table 27-2--TRIGVECTOR parameters change AID12\_LIST to AID11\_LIST. At the end of the NOTE add "The MSB of the AID is always 0." | **Rejected.****Reason:** The parameter AID12\_LIST is a list of AIDs of the intended STA in format of AID12 field as defined in 9.3.1.22. Though the comment is partially right that as in current definition only 1~2007 is used, it’s not necessary to create a new AID11 format which can hardly provide a benefit in performance and complexity. |
| 22382 | 27.2.2 |  | CID 20707. "SCRAMBLER\_INITIAL\_VALUE" would be clearer as "SCRAMBLER\_INITIALIZATION\_FIELD", since what the scrambler initial value is \*not\* what is being communicated; what is being communicated is the (scrambled) value of the Scrambler Initialization field. The resolution said "The group had discussion as in 11-18/0754r0 and agreed to name the parameter as "SCRAMBLER\_INITIAL\_VALUE." but that document is not about the name of the parameter, it's about what it contains in the TXVECTOR. Note that as Table 27-1 indicates, this parameter "In TXVECTOR, if present, indicates the value of the \*\*\*Scram-bler Initialization field\*\*\* in the SERVICE field, after scrambling.In RXVECTOR, indicates the value of the \*\*\*Scrambler Initial-ization field\*\*\* in the SERVICE field, prior to descrambling." (my emphasis) | Change "SCRAMBLER\_INITIAL\_VALUE" to "SCRAMBLER\_INITIALIZATION\_FIELD" throughout | **Rejected****Reason:** The parameter “SCRAMBLER\_INITIAL\_VALUE” has its specific definition without ambiguity. And the proposed new name “SCRAMBLER\_INITIALIZATION\_FIELD” doesn’t provide more explanation that saves readers’ time to check the definition of the parameter before understanding it. **Discussion:**The commented text should be at pg484/ln48. |
| 22383 | 26.2.6.3 |  | CID 20719. The point is that the current text is not crystal clear, and so to avoid interop problems a NOTE would be helpful | After the para referring to SCRAMBLER\_INITIAL\_VALUE in the referenced subclause add a "NOTE---The TXVECTOR parameter SCRAMBLER\_INITIAL\_VALUE does not contain the scrambler seed. The scrambler seed to be must be derived from this parameter. | **Rejected****Reason:**The commented interop problems don’t exist.**Discussion:**In current spec, it’s clearly stated that the parameter SCRAMBLER\_INITIAL\_VALUE in TXVEXCTOR for transmitting CTS frame is set to the same value as the RXVECTOR parameter SCRAMBLER\_INITIAL\_VALUE of the PPDU carrying MU-RTS trigger frame, to guarantee that the received CTS frames from different STAs are completely identical at PHY level, as defined in sub-clause 26.2.6.3. Furthermore, the scrambling process is clearly defined in sub-clause 27.3.11.4.  |
| 22415 | 476.64 | 27.2.2 | CID 21020. Resolution claims that "The current note for parameter of "CH\_BANDWIDTH" for HE\_TB PPDU as in Table 27-1 has addressed the comment." but it hasn't, since the comment was about adding to the NOTE! | In the NOTE for CH\_BANDWIDTH in Table 27-1 append ", which is in the TXVECTOR parameter RU\_ALLOCATION" | **Rejected.****Reason:**The current note for parameter of “CH\_BANDWIDTH” for HE\_TB PPDU as in Table 27-1 has addressed concern as in the original comment and the proposed change doesn’t provide more clarification about the parameter “CH\_BANDWIDTH”. **Discussion:** The comment CID 21020 (again, repeating CID 16115) is “The comment was about HE TB PPDUs, and specifically those where the PPDU is OFDMA, i.e. does not span the full channel bandwidth”. It’s exactly what the current Note means, “The TXVECTOR parameter CH\_BANDWIDTH does not represent the channel width of the transmitted PPDU”. That’s why the CID 21020 is rejected with the reason “The current note for parameter of “CH\_BANDWIDTH” for HE\_TB PPDU as in Table 27-1 has addressed the comment.” Further, the commenter requested to extend the current note with an additional statement “, which is in the TXVECTOR parameter RU\_ALLOCATION”. The requested adding is to explain what the channel width of a transmitted PPDU is when it’s an HE\_TB PPDU, especially when it’s an OFDMA PPDU. But that explanation is not about the CH\_BANDWIDTH itself and it’s not supposed to happen at a place specifically for the explanation for CH\_BANDWIDTH parameter.   |
| 22418 | 27.2.2 | 486.52 | CID 20899. The resolution doesn't seem to address the comment. | In Table 27-1, after "For an HE TB PPDU, [...] MU in the RXVECTOR column indicates the parameter is not present" append " (the receiver knows the values since they were specified in the triggering PPDU)" | **Rejected****Reason:**Commenter’s intention could be understood but the proposed change to add extra explanation is not necessary since the reception related primitives parameters and operations for HE TB PPDU has been clearly described in 8.3.5.18, 27.2.1 and 27.2..3 |
| 22458 | 27.2.2 | 476.22 | What is "a higher frequency?" | Need to clarify what "a higher frequency" is with respect to. | **Revised****Discussion:**The commented definition is about the enumerated value “ER-RU-H-106” which is defined as “ER-RU-H-106 for a higher frequency 106-tone RU in the primary 20 MHz channel”. The comment is correct that the current statement is not accurate in syntax. **Instruction to TGax Tech Editor:** Please implement the proposed modification to 11ax spec draft D5.0 as part of the resolution to CID 22458 as in 11-19/1896r2. |
| 22459 | 27.2.2 | 384.19 | Line 10 states ".... the pre-HT modulated fields might be beamformed." Should it be a definite statement like " ... is beamformed?" If not, please add the conditions that is not. | Please clarify as in the comment line if agreed. | **Revised****Discussion:**The commented text is supposed to be at P484 L19. The addressed Note at P484L19 was added to resolve the CID16768 as in 11-18-2023-02-00ax-comment-resolution-on-cid-16768, as cited for clarification below: “Supporting BEAM\_CHANGE or not at receiver does not affect the reception. Any STA can support BEAM\_CHNAGE = 0 and BEAM\_CHNAGE = 1 case without any efforts. Smoothing or not is a receiver’s decision. Receivers should check if the channel can be smoothed or not. Even for beamformed HE frames, the channel needs to be smoothable if 1x HE-LTF and 2x HE-LTF are used. Knowing the Beamformed from HE-SIGA does not help the preamble reception. So adding the capability bit is not necessary.However, adding an informative note about the setting of BEAM\_CHANGE may help the understanding. The note is added to the Table 28-1—TXVECTOR and RXVECTOR parameter”However, I agree with the commenter that the term “might” in the mentioned Note is confusing though it’s supposed to provide more helping clarification. The added Note should be very clear to both transmitter and receiver what it means when BEAM\_CHANGE=0 and BEAMFORMED=1, though it causes no difference to the receiver whether pre-HE portion of the received HE PPDU is beamformed or not. A note could be added to the sub-clause where the related function is described if there’s comment for that in future. **Instruction to TGax Tech Editor:** Please remove the Note at Pg484/Ln18, as the proposed modification to 11ax spec draft D5.0 as part of the resolution to CID 22459 as in 11-19/1896r1. |
| 22554 | 27.2.2 | 477.10 | There are two instances of INACTIVE\_SUBCHANNELS in the TXVECTOR/RXVECTOR - P477L10 and P486L35. | Merge the two instances of INACTIVE\_SUBCHANNELS into one. | **Revised.****Discussion:** Agree on the comment.**Instruction to TGax tech editor:**Please implement the proposed modification to 11ax spec draft D5.0 as part of the resolution to CID 22554 as in 11-19/1896r2. |

*--------------* ***Proposed Spec Text Modifications for Resolution to CID 22458/22459/22554*** *-------------------*

***TGax Editor: please modify Table 27-1 (TXVECTOR and RXVECTOR parameters) under clause 27.2.2.2 TXVECTOR and RXVECTOR parameters as below as part of resolution to CID 22458(P.L. 476.22), CID 22459(P.L 484.19) and 22554(P.L 477.10)***

**27.2.2 TXVECTOR and RXVECTOR parameters**

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**Table 27-1—TXVECTOR and RXVECTOR parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| **…** | **…** | **…** | **…** | **…** |
| **CH\_BANDWIDTH** | **…** | **…** | **…** | **…** |
| FORMAT is HE\_ER\_SU | Indicates the channel width of the PPDU.Enumerated type:ER-RU-242 for ~~a~~the 242-tone RU in the primary 20 MHzchannelER-RU-H-106 for ~~a~~the higher frequency 106-tone RU in the primary 20 MHz channel*[CID#22458]* | Y | Y |
| **…** | **…** | **…** | **…** |
| **BEAM\_CHANGE** | FORMAT is HE\_SU or HE\_ER\_SU | Integer:Set to 0 to indicate that the spatial mapping of the pre-HE modulated fields are the same as the first symbol of HE-LTF field.Set to 1 to indicate that the spatial mapping of the pre-HE modulated fields are different from the first symbol of HE-LTF field.~~NOTE—If BEAM\_CHANGE is 0 and BEAMFORMED is 1, then the pre-HE modulated fields might be is beamformed.~~  *[CID#22459]* | Y | Y |
| Otherwise  | Not present | N | N |
| **…** | **…** | **…** | **…** | **…** |
| **INACTIVE\_SUBCHANNELS** | FORMAT is HE\_MU and CH\_BANDWIDTH is any value for preamble puncturing, or FORMAT is NON\_HT and NON\_HT\_MODULATION is NON\_HT\_DUP\_OFDM, or FORMAT is HE\_SU and PSDU\_LENGTH is 0 *[CID#22554]* | Indicate the 20MHz subchannels that are puncturedA 8-bit bitmap ~~array~~ indexed by the 20Mhz subchannels in ascend order with the LSB indicating the lowest frequency 20MHz subchannel. A bit is set to 1 to indicate that the corresponding 20MHz is punctured and set to 0 to indicate the corresponding 20MHz is not punctured. *[CID#22554]* | Y | N |
| Otherwise  | Not present | N | N |
| **…** | **…** | **…** | **…** | **…** |
| **~~INACTIVE\_SUBCHANNELS~~** | ~~FORMAT is NON\_HT and NON\_HT\_MODULATION is NON\_HT\_DUP\_OFDM, or FORMAT is HE\_SU and PSDU\_LENGTH is 0~~ | ~~Indicates whether or not 20MHz subchannel is punctured. INACTIVE\_SUBCHANNELS is an 8-bit map with an encoding that is the same as that for the Disallowed subchannel Bitmap subfield (see 9.3.1.19(VHT/HE NDP Announcement frame format))~~ *[CID # 22554]* | ~~O~~ | ~~N~~ |
| ~~Otherwise~~  | ~~Not present~~ *[CID # 22554]* | ~~N~~ | ~~N~~ |

-------------------- ***End of proposed changes for resolution to CID 22459/22554*** *---------------------*

**References:**

1. **IEEE P802.11axTM/D5.0, Oct 2019.**