IEEE P802.11
Wireless LANs

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| Coding and other comments |
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Abstract

This submission proposes resolutions for the following comments related to TGax D0.1:

‒ 1778, 1784, 2063, 2064, 2065, 2069, 2071, 2073, 2074, 925, 2561, 2560, 2562, 2076, 2070, 332, 2075, 328, 329, 331, 2160, 2161, 2164, 2067

Revisions:

* Rev 0: Initial version of the document.

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** | **Clause Number** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 1778 | 26.3.12.4.2 | 156.43 | "The Trigger frame shall use..." Belongs in the Trigger frame format description | Add the field to the Trigger frame in 9.3.1.23. Add a TXVECTOR parameter for this option. In the PHY clause define the waveform for each case with statements like "If the TXVECTOR parameter YYY is SINGLE\_STREAM\_PILOTS, then the HE-LTF field is ....". | RevisedChange already present in D0.4 and addressed in IEEE 802.11-16/0813r3  |
| 1784 | 26.3.12.4.3 | 156.55 | Don't the "pre-corrections" that apply to UL MU-MIMO also apply to UL OFDMA? Ditto for power control. Even if there are parameter differences I would still describe the "corrections" in a common subclause. | Rework the UL MU-MIMO subclause so that it describes HE trigger-based PPDU transmission in general and not specifically UL MU-MIMO. Subclauses might include "Frequency offset and sampling clock adjustment" (instead of "pre-corrections"), "Transmit power | RevisedChange already present in D0.4 and addressed in IEEE 802.11-16/775r2 |
| 2063 | 26.3.10.4 | 136.21 | Wrong references | On line 21: 26.3.10.3.1 should be 26.3.10.4.1. On line 22: 25.3.10.3.2 should be 26.3.10.4.2. | RevisedChange already present in D0.4 via CID 2803 (pg. 200, line 36) |
| 2064 | 26.3.10.4 | 136.38 | Optional support for LDPC needs to be indicated | If LDPC is optional for certain configurations, there should be a place to indicate it (like HE capabilities). It doesn't look like any indication is provided. | RevisedTGax Editor to make the changes shown in IEEE 802.11-16/1170r1 |
| 2065 | 26.3.10.4.1 | 136.54 | N\_ES is alawys 1 | If N\_ES is removed as a separate notation, it should be removed from (26-68) | RevisedChange already present in D0.4 (eq 26-69, pg. 201, line 5-6) |
| 2069 | 26.3.10.4.2 | 138.19 | Wrong reference | 25.3.10.3.4 should be 26.3.10.4.4 | RevisedProposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-16/1259r0 |
| 2071 | 26.3.10.4.4 | 138.40 | Correct notation | N\_init,u should be N\_SYM,init,u | RevisedProposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-16/yyyyr0 |
| 2073 | 26.3.10.4.4 | 139.63 | Sentence out of place | This sentence about BCC sits between two sections dealing with LDPC. Move to page 140, line 8 instead when discussion on N\_SYM is complete.. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2074 | 26.3.10.4.4 | 139.63 | Wrong reference | Reference to (26-76) should probably be (26-88). (26-76) is for SU, while this section deals with MU. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 925 | 26.3.10.4 | 136.35 | Insert the text for clarification | Change "declaring support for more than 4 spatial streams" to "declaring support for more than 4 spatial streams in case of SU-MIMO"? | RejectedD0.4 improves upon D0.1, referring HE Capabilities element. See pg. 200, line 52, “according to HE capabilities field as defined in 9.4.2.213 (HE Capabilities element).” No further clarification required |
| 2561 | 26.3.10.1 | 132.51 | Data field come right after the HE-LTF field for all HE PPDU types, not just UL MU transmissions. | Delete the last sentence on P132L51. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2560 | 26.3.10.1 | 132.45 | Number of OFDM symbols in the Data field is also a function of the Packet Extension duration | Add that Packet Extension also plays a role in determining the number of OFDM symbols in the Data field. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2562 | 26.3.10.1 | 132.54 | Instead of writing the same thine twice all the time between BCC and LDPC, just define Ntailbits = 0 for LDPC. And let LDPC packets "have" tails bits of duration 0. | Instead of writing the same thine twice all the time between BCC and LDPC, just define Ntailbits = 0 for LDPC. And let LDPC packets "have" tails bits of duration 0. | RejectedCurrent way of explicitly spelling fields that contribute to data for both BCC and LDPC is clearer  |
| 2076 | 26.3.10.4.4 | 140.34 | Include MAC vs. PHY padding at end of 26.3.10.4.4 | Similar to paragraph starting on line 47, page 135 | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2070 | 26.3.10.4.3 | 138.29 | Clarify sentence | Replace "NPAD.POST-FEC bits with arbitrary 0 or 1 values (TBD) are appended after the FEC output bits in each of the last mSTBC OFDM symbols." with "The bits modulated on each of the last m\_STBC symbols shall consist of N\_CBPS,LAST bits from the FEC output followed by N\_PAD,POST-FEC post-FEC padding bits. The values of the post-FEC padding bits are not specified." | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 332 | 26.3.10.4.4 | 140.32 | The equation for the number of post FEC padding bits should not include m\_STBC. It is stated that the bits are added in each m\_STBC symbol (similar to the SU case).A separate section was created in the SU case, perhaps the same could be done for the MU equations as well.The ppost-FEC padding bits are also undefined. | Remove m\_STBC from the equation or remove it from the description of the equation. The result should be consistent for both SU and MU cases. Add the post fec description and equation in a separate section.Mention explicitly that the post-FEC padding bits are undefined and up to implementation. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2075 | 26.3.10.4.4 | 140.32 | Correct (26-92) | (26-92) is defined as the number of padding bits in EACH of the last m\_STBC symbol. As such, it should not have a multiplication with m\_STBC. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 328 | 26.3.10.4.1 | 137.01 | The expression for N\_DBPS\_LAST is missing prior to eq 26-71 | Provide expression for N\_DBPS\_LAST = N\_DBPS\_LAST\_Init for completeness or an explnation as to why it is not needed. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 329 | 26.3.10.4.2 | 138.11 | The expression for N\_DBPS\_LAST is missing prior to eq 26-78 | Provide expression for N\_DBPS\_LAST = N\_DBPS\_LAST\_Init for completeness. I understand that N\_DBPS\_LAST is not used in the computations for SU. However, there may be some confusion as to why it has not been updated. I think that the assignment that the value does not change helps to clarify. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 331 | 26.3.10.4.4 | 140.11 | In equation 26-90, it seems that N\_DBPS\_LAST and N\_CBPS\_LAST are updated based on the a factor for both BCC and LDPC users. However, its seems that this needs to be updated only for BCC users. For LDPC users only N\_CBPS\_LAST needs to be updated. | Clarify that the N\_DBPS last is updated only for BCC users. For LDPC users N\_DBPS\_LAST = N\_DBPS\_LAST\_init. I realize that the pre-FEC padding bits for LDPC users were calculated based on N\_DPBS\_LAST\_init and so we may be fine. However, this difference between LDPC and BCC users can be clearly expressed by this change and the N\_DBPS\_LAST value for LDPC users would be accurate. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2160 | 26.3.12.3.2 | 173.29 | PHY Motion 146 was approved in Macau meeting, but no corresponding spec text is present in the draft | Add description for the following: Move to add to the spec framework that2X HE-LTF sequence shall be the only mandatory mode for NDP. 4X HE-LTF shall not be supported in NDP. | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2161 | 26.3.12.3.2 | 173.29 | PHY Motion 147 was approved in Macau meeting, but no corresponding spec text is present in the draft | Add description for the following: Move to add to the spec framework thatThe NDP always has extension of 4uSThe NDP shall support the CP values 0.8 us and 1.6 us | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |
| 2164 | 26.3.12.3.2 | 173.29 | PHY Motion 150 was approved in Macau meeting, but no corresponding spec text is present in the draft | Add description for the following: Move to add to the spec framework thatThe max Nc for sounding feedback that a BFee can support shall be negotiated through a capability exchange at association | RevisedChange already present in D0.4. Resolution presented in IEEE 802.11-16/0773r2 |
| 2067 | 26.3.10.4.2 | 137.19 | Definition of N\_pld | "Data field including the scrambled SERVICE, PSDU, and pre-FEC pad bits are encoded". For clarity and consistency with this statement, first define N\_pld as:N\_pld = Nservice + 8\*APEP\_LENGTH + NPAD,pre-FEC, followed by current (26-72) | RevisedProposed resolution accounts for suggested changeTGax Editor to make the changes showin in IEEE 802.11-16/1259r0 |

*Changes to D0.4 related to CID 2069*

*Section 26.3.11.4.2, page 202, line 31*

Replace the reference as follows

~~Refer to 25.3.10.3.4~~ Refer to 26.3.11.4.4

*Changes to D0.4 related to CID 2071*

*Section 26.3.11.4.4, page 202, line 54*

Make the following replacement

*~~N~~~~init.u~~ NSYM.init.u*

*Changes to D0.4 related to CID 2073, 2074*

*Section 26.3.11.4.4, page 204, line 1-2*

Delete lines 1-2

~~Note that users with BCC encoding shall also use the common~~ *~~NSYM~~* ~~and a parameters as in Equation (26- 77).~~

Add the following line below Eqn 26-90 (line 10)

Note that users with BCC encoding shall also use the common *NSYM* and a parameters as in Equation (26- 89).

*Changes to D0.4 related to CID 2561*

*Section 26.3.11.1, page 196, line 54-55*

Delete the following line

~~The Data field in UL MU transmissions shall immediately follow the HE-LTF field.~~

*Changes to D0.4 related to CID 2560*

*Section 26.3.11.1, page 196, line 50-51*

Insert the text in red as shown below

setting of the GI+LTF Size, A-factor and PE-disambiguity fields in HE-SIG-A (see 26.3.10.7 (HE-SIG-A)).

*Changes to D0.4 related to CID 2076*

 *Section 26.3.11.4.4, page 204, line 36*

Add the following text on line 36, before Section 26.3.11.4.5

Among the pre-FEC padding bits, the MAC delivers a PSDU that fills the available octets in the Data field of the HE PPDU, toward the desired pre-FEC padding boundary, represented by a\_init value, in the the last OFDM symbol(s). The PHY then determines the number of pad bits to add and appends them to the PSDU. The number of pre-FEC pad bits added by PHY will always be 0 to 7. The procedure is defined in Equation (26-xx).

$$N\_{PAD,Pre-FEC,MAC}=8\left⌊\frac{N\_{PAD,Pre-FEC}}{8}\right⌋ $$

$$N\_{PAD, Pre-FEC, PH Y}=N\_{PAD,Pre-FEC} mod 8$$

*Changes to D0.4 related to CID 2070,332, 2075*

*Section 26.3.11.4.4, page 204, line 34*

Replace Equation 26-93 (strikethrough below) with the equation in black

*~~N~~~~PAD,Post-FEC,u~~ ~~= m~~~~STBC~~~~(N~~~~CBPS,u~~ ~~– N~~~~CBPS,LAST,u~~~~)~~ NPAD,Post-FEC,u = NCBPS,u – NCBPS,LAST,u*

*Section 26.3.11.4.3, page 202, line 42*

Replace the line with the text below

*~~N~~*~~PAD.POST-FEC bits with arbitrary 0 or 1 values (TBD) are appended after the FEC output bits in each of the last~~ *~~m~~*~~STBC OFDM symbols~~ The last *mSTBC* symbols shall consist of *NCBPS.LAST* bits from the FEC output followed by *NPAD,POST-FEC* post-FEC padding bits. The values of the post-FEC padding bits are not specified and are left up to implementation.

*Changes to D0.4 related to CID 328*

*Section 26.3.11.4.1, page 201, line 17*

Insert the following text below equation 26-71

The number of data bits per symbol in the last OFDM symbol(s) of an HE SU PPDU is

 

*Changes to D0.4 related to CID 329*

*Section 26.3.11.4.2, page 202, line 29*

Insert the following text below equation 26-79

For completeness, the number of data bits of the last symbol 

*Changes to D0.4 related to CID 331*

*Section 26.3.11.4.4, Page 204*

Remove line 12 and equation 26-91 and replace with the following

For the users with LDPC encoding, 

For the users with BCC encoding, update the *NDBPS* of the last symbol as

 

For each user with either LDPC or BCC encoding, update the *NCBPS* of the last symbol as



*Changes to D0.4 related to CID 2160, 2161*

*Section 26.3.2, Page 127, Line 27-28*

Make the following changes

 ~~The HE NDP PPDU is an HE SU PPDU where the Data field contains zero OFDM symbols and the PE field has a 4 μs duration.~~ The HE NDP PPDU has the following properties:

* Uses the HE SU PPDU format but without the data field.
* Has a Packet Extension field that is 4 us in duration

*Section 26.3.10.10, Page 187, Line 10*

Add the following line before “The duration of each HE-LTF symbol …”

For an HE NDP PPDU, (2x HE-LTF, *TGI1,Data*) and (2x HE-LTF, *TGI2,Data*) are the only mandatory combinations of (LTF mode, GI duration) and (4x HE-LTF, *TGI4,Data*) is supported as an optional mode. There is no support for 1x HE-LTF.

*Changes to D0.4 related to CID 2067*

*Section 26.3.11.4.2, Page 201, line 30*

Add the underlined text/equation after “pre-FEC pad bits are encoded” and before the full stop

… the scrambled SERVICE, PSDU, and pre-FEC pad bits are encoded i.e.

 