IEEE P802.11
Wireless LANs

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| CR for PHY PPDU formats |
| Date: 2018-01-10 |
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Abstract

This submission proposes resolutions for the following comments on PHY PPDU formats of TGax D2.0:

* 11423, 11440, 11566, 11721, 11892, 12062, 13015, 13311, 13445,

13596, 13597, 13598, 13599, 13600, 13767, 14065, 14201, 14336

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** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 11423 | 28.3.4 | 372.54 | In 80Mhz PPDU frequency segment of Figure 28-12, there is no null subcarrier between 242RU tone in one side of 40Mhz bandwidth | Re-figure 80MHz bandwidth part of Figure28-12 | **Revised.**Removed the lines between the 242 tone RUs in the figure. *TGax Editor*: Please change the text (marked as CID 11423) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 11440 | 28.3.4 | 372.65 | The figure 28-12 describes the tone plan for HE PPDU data field, not matching the figure's title or its purpose. | provide a corresponding figure to match the description in the paragraph above the figure. | **Revised.**The figure is illustrating the whole channel width of pre-HE modulated fields in an HE TB PPDU for a given RU allocation. Different color represents different number of 20Mhz channels on which pre-HE modulated fields duplicate. The description is not clear enough. Propose to add some clarification. *TGax Editor*: Please change the text (marked as CID 11440) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 11566 | 28.3.4 | 370.64 | I count six PPDU formats: HE SU PPDU, HE MU PPDU, HE ER SU PPDU, HE TB PPDU, HE TB NDP feedback PPDU, and HE NDP PPDU. Please correct. | as in comment | **Revised.**HE NDP PPDU is a special type of HE SU PPDU and HE TB NDP feedback PPDU is a special type of HE TB PPDU. Propose to keep 4 PPDU format and add a clarification sentence on the two special PPDU.*TGax Editor*: Please change the text (marked as CID 11566) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 11721 | 28.3.4 | 371.28 | It is desireable to describe the allowed PHY paramters (MCS, RU size etc) for HE ER SU PPDU in one place; current the limitions are scattered in the spec | Add description of what constraints are for HE ER SU PPDU | **Rejected.**The constraints on MCS, Nsts, RU size etc are already described together in table 28-18 HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU.  |
| 11892 | 28.3.17 | 485.09 | In Figure 28-44, the duration of HE-STF should be 8us instead of 4us. | Revise the figure as in comment | **Revised.**Revised Figure 28-44 based on the comment. *TGax Editor*: Please change the text (marked as CID 11892) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 12062 | 28.3.17 | 485.00 | Since HE TB NDP Feedback PPDU will be transmitted simultaneously from multiple-STAs (kind of UL MU), HE-STFshould be 8us instead of 4us. | Change the duration of HE-STF from 4us to 8us in the Figure 28-44 | **Revised.**Revised Figure 28-44 based on the comment. *TGax Editor*: Please change the text (marked as CID 12062) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13015 | 28.3.4 | 372.55 | I don't get the color changes in RU lower than 484 in Figure 28-12 (for RU26, 52, 106, 242 for the 80 MHz HE PPDU). Please add clarification in the above paragraph if this emphasis was really intended. | As in comment | **Revised.**The figure is illustrating the whole channel width of pre-HE modulated fields in an HE TB PPDU for a given RU allocation. Different color represents different number of 20Mhz channels on which pre-HE modulated fields duplicate. The description is not clear enough. Propose to add some clarification. *TGax Editor*: Please change the text (marked as CID 13015) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13311 | 28.3.17 | 485.01 | Move the HE TB NDP feedback PPDU format description to 28.3.4. | Technical comment because there may be changes to the technical desciption as a result of the move. | **Revised.**HE TB NDP feedback PPDU can be seen as a special type of HE TB PPDU. See resolution for CID 11566.*TGax Editor*: Please change the text as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13445 | 28.3.4 | 372.43 | pre-HE preamble is not defined. | Define | **Revised.**Change to pre-HE modulated fields which is defined above the figure. *TGax Editor*: Please change the text (marked as CID 13445) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13596 | 28.3.4 | 372.38 | Figure 28-12 could be mislead the pre-HE preamble could be transmitted as 26-tone RU or 52-tone RU as an example. The description and illustration of the figure should be changed for better clarification | Change the description of the figure as 'and the Figure 28-12 represents the whole channel width of the duplicated pre-HE moduled field for a given HE modulated fields in HE TB PPDU.' and caption of the Figure as 'HE modulated fields and the corresponding pre-HE modulated fiels duplication mapping in an HE TB PPDU'. Finally, change the description of 20MHz/40MHz/80MHz pre-HE preamble in the figure as '20 MHz pre-HE modulated fields' , '40 MHz duplicated pre-HE modulated fields', '80 MHz duplicated pre-HE modulcated fields', accordingly. | **Revised.**Agree in principle. Revised the figure and the description text based on the comment. *TGax Editor*: Please change the text (marked as CID 13596) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13597 | 28.3.4 | 376.28 | single user HE transmission does not sound accurate. 26/52-tone can be used typically for a portion of a user in HE MU/HE TB PPDU transmission | change 'a single user HE transmission within a 26-' to 'one user portion of HE PPDU transmission of a 26-' | **Revised.**Agree in principle. Figure 28-17 and 28-18 can be used for the data field of all non DL MU-MIMO transmissions. Data field of non DL MU-MIMO include data field of HE SU PPDU, data field of a STA on single user allocated RU in DL/UL OFDMA or data field of a STA that is part of UL MU-MIMO transmission. *TGax Editor*: Please change the text (marked as CID 13597) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13598 | 28.3.4 | 376.30 | SU transmission definition is not crystal clear | Clarify this is one user portion of HE SU /HE ER SU/HE MU/HE TB PPDU | **Revised.**Agree that SU transmission is not clear enough. In some of the spec text, SU transmission means HE SU PPDU transmission. Here SU transmission include tx of data field for STA on a single user allocated RU in DL/UL OFDMA transmission and tx of data field for STA in UL MU-MIMO transmission. *TGax Editor*: Please change the text (marked as CID 13598) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13599 | 28.3.4 | 376.31 | downlink or uplink HE PPDU could be informal naming | change to 'HE MU PPDU and HE TB PPDU' accordingly | **Revised.**Agree in principle. Propose change to DL/UL OFDMA transmission. *TGax Editor*: Please change the text (marked as CID 13599) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13600 | 28.3.4 | 377.27 | This figure is not for HE SU transmission. The terminology HE SU transmission is confusing with PPDU format namings.0 | change 'an HE SU transmisison' to 'one user portion of HE PPDU transmission' | **Revised.**Agree in principle. Change the terminology to “non DL MU-MIMO”*TGax Editor*: Please change the text (marked as CID 13600) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 13767 | 28.3.17 | 485.12 | Figure 28-44--HE TB NDP feedback PPDU format, HE-STF duration should be 8us instead of 4us | change HE-STF duration to be 8us | **Revised.**Revised Figure 28-44 based on the comment. *TGax Editor*: Please change the text (marked as CID 13767) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 14065 | 28.3.4 | 373.09 | Signal Extension is needed for HT PPDUs as well, as well as 20 MHz 11g. | Add HT and NON\_HT (11g) in the cases requiring Signal Extension. Same for P373L20. | **Revised.**Agree in principle. Add the FORMATs following 19.3.2*TGax Editor*: Please change the text (marked as CID 14065) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 14201 | 28.3.17 | 485.21 | PE\_duraton is not defined in the spec. it should be PE\_DURATION. | as in comment | **Accepted.***TGax Editor*: Please change the text (marked as CID 14201) as indicated in **doc.: IEEE 802.11-18/0151r0** |
| 14336 | 28.3.4 | 372.36 | "When the HE modulated fields are located in more than one 20 MHz channel, the pre-HE modulated fields are duplicated over the multiple 20 MHz channels, as shown in Figure 28-12 (Pre-HE modulated fields in an HE TB PPDU)." should have some limitation on RU selection. If the center 26 RU of the 80MHz is selected, then the pre-HE modulated fields will occupy 2 20MHz channels and mute the whole 40MHz channel. For such a small RU, the price to pay is too high. Should put some limititation on this rule. | as in the comment | **Revised.**Agree in principle. In 80Mhz, there are 3 26-tone RU located on 2 20MHz channels, namely 26-tone RU10, RU19 and RU28. Allocation on these 3 RUs requires sending the pre-HE modulated part on 2 20MHz channels in HE TB PPDU. AP should avoid allocation of these RUs as the only RU selection in the HE TB PPDU. Propose to add a constraint that AP should not allocate 26-tone RU10, RU19 or RU 28 in 80Mhz as the only RU in their occupied 40Mhz channel for HE TB PPDU.*TGax Editor*: Please change the text (marked as CID 14336) as indicated in **doc.: IEEE 802.11-18/0151r0** |

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**28.3.4 HE PPDU formats**

Four HE PPDU formats are defined: HE SU PPDU, HE MU PPDU, HE ER SU PPDU and HE TB PPDU. Note that HE NDP PPDU is a special type of HE SU PPDU and HE TB NDP feedback PPDU is a special type of HT TB PPDU. Details of these two types of PPDU are defined in 28.3.16 and 28.3.17. (CID 11566)

***TGax Editor: Please edit the following text on D2.0 P485Ln12, as shown below. (CID 11892, 12062, 13767).***



**Figure 28-44—HE TB NDP feedback PPDU ~~format~~**

***TGax Editor: Please edit the following text on D2.0 P376Ln27.***

Figure 28-17 (Transmitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in a 26-, 52-, 106- or 242-tone RU with BCC encoding) shows the transmitter blocks used to generate the Data field of a ~~single user~~ non DL MU-MIMO (CID 13597) HE transmission within a 26-, 52-, 106-, or 242-tone RU with BCC encoding for a single frequency segment when the number of spatial streams is less than or equal to 4. ~~This includes the SU transmission in an RU that is part of a downlink or uplink HE PPDU using OFDMA transmission, and a transmission from one STA that is part of an UL MU-MIMO transmission in current RU.~~ The data field of non DL MU-MIMO HE PPDU includes data field of HE SU PPDU, data field for a STA on single user allocated RU in a DL or UL OFDMA transmission and data field for a STA that is part of an UL MU-MIMO transmission. (CID 13598, 13599)

***TGax Editor: Please edit the following text on D2.0 P377Ln31.***

Figure 28-18 (Transmitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in 26-, 52-, 106-, 242- , 484- or 996-tone RU with LDPC encoding) shows the transmitter blocks used to generate the Data field of a ~~single user~~ non DL MU-MIMO (CID 13597) HE transmission within a 26-, 52-, 106-, 242-, 484-, or 996-tone RU with LDPC encoding for a single frequency segment. ~~This also includes the SU transmission in an RU that is part of a downlink or uplink OFDMA PPDU, and a transmission from one STA that is part of an UL MU-MIMO transmission in current RU.~~ (CID 13598, 13599)

***TGax Editor: Please edit the following text on D2.0 as shown below that are related to CID 13600.***

***TGax Editor: Please edit the following text on D2.0 P21Ln10.***

Figure 28-17—Transmitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in a 26-, 52-, 106- or 242-tone RU with BCC encoding................................................................................................................ 377

***TGax Editor: Please edit the following text on D2.0 P21Ln12.***

Figure 28-18—Transmitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in 26-, 52-, 106-, 242- , 484- or 996-tone RU with LDPC encoding ............................................................................................... 378

***TGax Editor: Please edit the following text on D2.0 P376Ln42.***

Figure 28-17 (Trans-mitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in a 26-, 52-, 106- or 242-tone RU with BCC encoding)

***TGax Editor: Please edit the following text on D2.0 P377Ln27.***

**Figure 28-17—Transmitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in a 26-, 52-, 106- or 242-tone RU with BCC encoding**

***TGax Editor: Please edit the following text on D2.0 P378Ln27.***

**Figure 28-18—Transmitter block diagram for the Data field of an HE ~~SU~~ non DL MU-MIMO transmission in 26-, 52-, 106-, 242-, 484- or 996-tone RU with LDPC encoding**

***TGax Editor: Please edit the following text on D2.0 P485Ln21, as shown below.***

— Uses the HE TB PPDU format but without the Data field and with PE\_~~duration~~DURATION = 0 (CID 14201)

***TGax Editor: Please edit the following text on D2.0 P373Ln5-21 as shown below.***

A Signal Extension shall be present in a transmitted PPDU, based on the parameters of the TXVECTOR, when the NO\_SIG\_EXTN parameter is equal to false and either of the following is true:

— The FORMAT parameter is equal to HE

— The FORMAT parameter is equal to HT\_MF or HT\_GF.

— The FORMAT parameter is equal to NON\_HT, and the NON\_HT\_MODULATION parameter is equal to ERP-OFDM, or NON\_HT\_DUP\_OFDM

A Signal Extension shall be assumed to be present (for the purpose of timing of PHY-RXEND.indication and PHY-CCA.indication primitives, as described below and in 28.3.21 (HE receive procedure)) in a received PPDU when either of the following is true, based on the determined parameter values of the RXVECTOR:

— The FORMAT parameter is equal to HE

— The FORMAT parameter is equal to HT\_MF or HT\_GF.

— The FORMAT parameter is equal to NON\_HT, and the NON\_HT\_MODULATION parameter is equal to ERP-OFDM, or NON\_HT\_DUP\_OFDM (CID 14065)

***TGax Editor: Please edit the following text on D2.0 P372Ln34-40 as shown below.***

In the HE TB PPDU, the pre-HE modulated fields, which include L-STF, L-LTF, L-SIG, RL-SIG and HE-SIGA fields, are sent only on the 20 MHz channels where the STA's HE modulated fields are located. When the HE modulated fields are located in more than one 20 MHz channel, the pre-HE modulated fields are duplicated over the multiple 20 MHz channels, as shown in Figure 28-12 (Pre-HE modulated fields in an HE TB PPDU). In 80MHz HE TB PPDU or an 80MHz frequency segment of a 160/80+80Mhz HE TB PPDU, 26-tone RU 10, RU 19 and RU 28 are located in two 20MHz channels and need a 40MHz duplicated pre-HE modulated fields. AP should not allocate these 3 RUs as the only RU in their located 40 MHz to avoid muting 40MHz channel for a 26-tone RU transmission. (CID 14336)

***TGax Editor: Please edit figure 28-12 on D2.0 P372Ln43-65 as shown below.***



**Figure 28-12—BW of Pre-HE modulated fields for different RUs in an HE TB PPDU** (CID 11423, 11440, 13015, 13445, 13596)