IEEE P802.11
Wireless LANs

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| Comment Resolutions on Clause 28.1.1 (HE PHY Introduction) Part 1 |
| Date: 2017-02-09 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Lochan Verma | Qualcomm Inc. | 5775 Morehouse Dr, San Diego, CA 92121 | +1-858-845-7832 | lverma@qti.qualcomm.com |
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Abstract

This submission proposes resolutions for the following 18 comments on Clause 28.1.1 of TGax D1.0:

3795, 4854, 4855, 4856, 4902,

4930, 4931, 5232, 5234, 5242,

5746, 5747, 5750, 5754, 5755,

5791, 10355, 10356

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Editorial improvements.

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** |
| 3795 | 28.1.1 | 210.64 | Bandwidth should be specific to 20 MHz channels | Add the word "channel" before "bandwidth" | Revised— Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 3795. |
| 4854 | 28.1.1 | 210.35 | replace HE\_TRIG PPDU by HE trigger-based PPDU | See comment | Revised— Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 4854. |
| 4855 | 28.1.1 | 212.40 | replace HE\_TRIG PPDU by HE trigger-based PPDU | See comment | Revised— Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 4855. |
| 4856 | 28.1.1 | 210.47 | replace HE\_EXT\_SU by HE extended range SU | See comment | Revised— Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 4856. |
| 4902 | 28.1.1 | 209.41 | The HE PHY provides support of functions not depending on the frequency band and capability. The dependency to the frequency band and device's capability makes sense in an implementation | Change to "..., depending on the frequency band and capability." | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 4902. |
| 4930 | 28.1.1 | 210.25 | If a STA supports more than 4SS, it's not a low complexity / low cost device. N oreason for it not to support LDPC | Ditto P210L29. Strike out "except when the STA is ... 20 MHz only non-AP STA". Need to update P210L60 et passim also | Revised—Agree in principal with the comment.Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 4930. |
| 4931 | 28.1.1 | 210.31 | "LDPC when declaring support for MCS10 and MCS11" | Is this for TX or RX or both? And all supported PPDU types, RU sizes etc? Be specific | Revised—Agree in principal with the comment.Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 4931. |
| 5232 | 28.1.1 | 210.35 | change "HE\_TRIG" to "HE trigger-based" | as in comment | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5232. |
| 5234 | 28.1.1 | 211.57 | Regarding, "The total number of spatial streams in the DL MU-MIMO transmission that the non-AP STA can receive shall be at least 4.", I'm assuming the intent here is that the non-AP STA should be able to handle a DL MU-MIMO transmission with four streams even if it has fewer than 4 antennas. If so, this statement isn't clear, as it could be misinterpreted as a required to receive 4 spatial streams. | Perhaps something like, "The non-AP STA shall be able to receive its intended spatial streams in a DL MU-MIMO PPDU with a total number of spatial streams of at least 4." | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5234. |
| 5242 | 28.1.1 | 212.40 | change "HE\_TRIG" to "HE trigger-based" | as in comment | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5242. |
| 5746 | 28.1.1 | 212.40 | Better to be consistent with line 36 which uses "HE trigger-based PPDU" | "HE\_TRIG PPDU" to "HE trigger-based PPDU" or change l ine 36 to be "HE\_TRIG PPDU" | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5746. |
| 5747 | 28.1.1 | 212.34 | "within a 20MHz PPDU and a full full bandwidth PPDU", does this full bandwidth PPDU refer to 20MHz full bandwidth PPDU or any bandwidth PPDU? | Clarify | Revised—Full BW refers to 20/40/80/160 MHz.Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5747. |
| 5750 | 28.1.4 | 213.58 | trigger-based PPDU can also be sent as a response to a PPDU that carries a frame which contains UL MU Response Scheduling A-Control field. | change to "is sent in response to a PPDU that carries a trigger frame or a frame that contains UL MU Resonse scheduling A-Control field". | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5750. |
| 5754 | 28.1.1 | 210.23 | According to SFD, STA supporting >4 spatial streams shall support LDPC and such requirment apply to 20MHz-only too. So this requirement is not correct. | Remove "except when the STA is a 20MHz only STA" | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5754. |
| 5755 | 28.1.1 | 210.27 | According to SFD, STA supporting >4 spatial streams shall support LDPC and such requirment apply to 20MHz-only too. So this requirement is not correct. | Remove "except when the STA is a 20MHz only STA" | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5755. |
| 5791 | 28.1.1 | 210.57 | 4xLTF and 0.8us GI is missing for the optional PHY feature. | Add 4xLTF and 0.8us GI in a new bullet | Revised—Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 5791. |
| 10356 | 28.1.1 | 210.28 | Need to decide on if the TV VECTOR name or full name is used in this section. | decide on using full name or acronym | Revised—Full names are used. Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 10356. |
| 10355 | 28.1.1 | 210.24 | "HE\_EXT\_SU PPDUs". Using the TX VECTOR parameter rather than the name. All the others use their actual names. | use term "HE extended range SU PPDU" for consistency | Revised—Full names are used. Proposed resolution accounts for the suggested change. TGax Editor to make the changes shown in IEEE 802.11-17/0243r1 under all headings that include CID 10355. |

***TGax Editor: Please edit D1.0, Pg 209, ln 40 in section 28.1.1 as follows.***

The HE PHY provides support for 20 MHz, 40 MHz, 80 MHz and 160 MHz contiguous channel widths and support for 80+80 MHz non-contiguous channel width~~, depending on the frequency band and capability~~. (#4902) For channel widths greater than or equal to 80 MHz, the HE PHY supports channel puncturing transmissions where one or more of the non-primary 20 MHz channels in an HE MU PPDU with more than one RU is zeroed out.

***TGax Editor: Please edit D1.0, Pg 210, ln 64 in section 28.1.1 as follows:***

* The STA is not capable of transmitting an HE SU PPDU with a channel (#3795) bandwidth greater than 20 MHz

***TGax Editor: Please edit D1.0, Pg 210, ln 35 in section 28.1.1 as follows:***

— HE-MCSs 0 to 7 (transmit and receive) in all supported channel widths and RU sizes for HE SU PPDUs, HE MU PPDUs, and ~~HE\_TRIG~~HE trigger-based (#4854, #5232, #10356) PPDUs

***TGax Editor: Please edit D1.0, Pg 212, ln 40 in section 28.1.1 as follows:***

— MU-MIMO transmit on an RU in an ~~HE\_TRIG~~HE trigger-based (#4855, #5242, #5746, #10356) PPDU where the RU does not span the entire PPDU bandwidth (UL MU-MIMO with OFDMA). If it is supported then a total of up to 8 space-time streams are supported

***TGax Editor: Please edit D1.0, Pg 210, ln 47 in section 28.1.1 as follows:***

— Single spatial stream HE-MCSs 0 - 2 in primary 20 MHz channel for ~~HE\_EXT\_SU~~ HE extended range SU (#4856, #10356) PPDUs

***TGax Editor: Please edit D1.0, Pg 210, ln 23 in section 28.1.1 as follows:***

— LDPC coding (transmit) in all supported HE PPDU types, RU sizes, and number of spatial streams if the STA declares support for transmitting more than 4 spatial streams except ~~when the STA is an 20 MHz only non-AP STA~~(#4930, #5754)

— LDPC coding (receive) in all supported HE PPDU types, RU sizes, and number of spatial streams if the STA declares support for receiving more than 4 spatial streams ~~except when the STA is an 20 MHz only non-AP STA~~(#4930, #5755)

***TGax Editor: Please edit D1.0, Pg 210, ln 60 in section 28.1.1 as follows:***

— LDPC coding (transmit) if the maximum number of spatial streams the STA is capable of transmitting in an HE SU PPDU is less than or equal to 4 (#4930)

• ~~the maximum number of spatial streams the STA is capable of transmitting in an HE SU PPDU is less than or equal to 4, and~~

~~• the STA is not capable of transmitting an HE SU PPDU with a bandwidth greater than 20 MHz~~

— LDPC coding (receive) if the maximum number of spatial streams the STA is capable of receiving in an HE SU PPDU is

less than or equal to 4 (#4930)

• ~~the maximum number of spatial streams the STA is capable of receiving in an HE SU PPDU is less than or equal to 4, and~~

~~• the STA is not capable of transmitting an HE SU PPDU with a bandwidth greater than 20 MHz~~

***TGax Editor: Please edit D1.0, Pg 210, ln 31 in section 28.1.1 as follows:***

— LDPC (transmit and receive) in all supported HE PPDU types, RU sizes, and number of spatial streams if the STA declares ~~when declaring~~ support for MCS10 and MCS11 (transmit and receive) (#4931)

***TGax Editor: Please edit D1.0, Pg 211, ln 57 in section 28.1.1 as follows:***

— Reception of an HE MU PPDU consisting of a single RU spanning the entire PPDU bandwidth and utilizing MU-MIMO (DL MU-MIMO). The maximum number of spatial streams per user the non-AP STA can receive in the DL MU-MIMO transmission shall be equal to the minimum of 4 and the maximum number of spatial streams supported for reception of HE SU PPDUs. ~~The total number of spatial streams in the DL MU-MIMO transmission that the non-AP STA can receive shall be at least 4.~~The non-AP STA shall be able to receive its intended spatial streams in a DL MU-MIMO transmission with a total number of spatial streams of at least 4. (#5234)

***TGax Editor: Please edit D1.0, Pg 211, ln 33 in section 28.1.1 as follows***

— ~~Reception of the payload of an HE MU PPDU over a 106-tone RU within a 20 MHz PPDU bandwidth and full bandwidth PPDU~~ Reception of the payload on an RU in an HE MU PPDU where RU spans the entire PPDU bandwidth or a 106-tone RU within 20 MHz PPDU bandwidth (#5747)

***TGax Editor: Please edit D1.0, Pg 210, ln 57 in section 28.1.1 as follows:***

— 0.8 μs GI duration on both HE-LTF and data symbols when the HE-LTF is a 1x or 4x (#5791) LTF (transmit and receive) for HE SU PPDUs

***TGax Editor: Please edit D1.0, Pg 213, ln 58 in section 28.1.4 as follows:***

— HE trigger-based PPDU format (HE\_TRIG) carries a single PSDU and is sent in response to a PPDU that carries a Trigger frame or a frame that contains UL MU Response scheduling A-Control field (#5750). The preamble format prior to the HE-STF field is identical to the HE SU PPDU. Support for the HE trigger-based PPDU format is mandatory.

**References:**

1. **IEEE P802.11axTM/D1.0, Nov 2016.**