IEEE P802.11
Wireless LANs

|  |
| --- |
| Comment Resolution on Trigger Frame Format |
| Date: 2019-07-09 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Lochan Verma | Qualcomm |  |  | lverma@qti.qualcomm.com |
|  |  |  |  |  |

Abstract

This submission shows

* Resolution for a comment received from TGax comment collection (TGax Draft D4.0)
* The proposed changes are based on 11ax D4.2.

The submission provides resolutions to comments related to Trigger Frame Format.

* The submission provides resolutions to 7 CIDs:
20521, 20522, 20725, 20858, 20859, 20860, 20861

Revisions:

* Rev 0: Initial version of the document.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20521 | 106.63 | "The AP Tx Power subfield of the Common Info field indicates the combined average power per 20 MHz bandwidth referenced to the antenna connector, of all antennas used to transmit the Trigger frame." is not clear. There are two interpretations of "combined". One interpretation is that the combining is performed over antenna, so the the AP Tx Power subfield has units of dBm/20 MHz. An alternative interpretation is that the combining is performed over multiples of 20 MHz, so the AP Tx Power subfield has units of dBm. [powerprecorr] | Change the cited text at the referenced location to "The AP Tx Power subfield of the Common Info field indicates the total power at the antenna connector(s), in dBm per 20 MHz bandwidth, over all antennas used to transmit the PPDU containing the Trigger frame."At 76.19, change "The DL TX Power subfield indicates the AP transmit power, in dBm, referenced to the antenna connector, combined over all TX antennas and normalized to 20 MHz bandwidth," to "The DL TX Power subfield indicates the total power at the antenna connector(s), in dBm per 20 MHz bandwidth, over all antennas used to transmit the PPDU containing the TRS Control field,"In 27.3.14.2 change the wording after the second "where" to:"Tx^AP\_pwr represents the AP's transmission power and is the value indicated by the AP Tx Power subfield of the Common field in the Trigger frame or of the TRS Control field.DL\_RSSI represents the RSSI at the antenna connector(s), over the PPDU bandwidth, from the non-HE portion of the HE PPDU preamble of the triggering PPDU, averaged over all antennas used to receive the triggering PPDU.NOTE---Tx\_^AP\_pwr is in units of dBm / 20 MHz; DL\_RSSI is in implementation-defined units; Target\_RSSI is in dBm. Equations (27-124) and (27-125) need to take account of the differing units." | Revised—Words used in the description of AP Tx Power subfield in the Trigger frame format and TRS Control field need improvement to describe the intended behaviour as represented in the 27.4.14 (Transmit requirements for an HE TB PPDU).TGax Editor: make changes for CID 20521 according to 11-19-1183-02-00ax. |

***Discussion***

In 27.4.14 (Transmit requirements for an HE TB PPDU) the AP Tx Power ($Tx\_{pwr}^{AP}$) represents the AP’s combined transmit power at the antenna connectors of all the transmit antennas used to transmit the Trigger frame and normalized to 20 MHz bandwidth. $Tx\_{pwr}^{AP}$ is dBm value of AP Tx Power subfield of the Common Info field in Trigger frame.

On the other hand, in 9.3.1.22 (Trigger frame format), the AP Tx Power subfield of the Common Info field indicates the combined average power per 20 MHz bandwidth referenced to the antenna connector, of all antennas used to transmit the Trigger frame.

The description in 9.3.1.22 needs improvement to align with Section 27.4.14.

Similar improvements are needed in the description of DL Tx Power subfield in the Control Information subfield for TRS Control.

***------------- Begin Text Changes ---------------***

***To TGax editor:***  *Make the following redline change on Pg/Ln 111/29*

The AP Tx Power subfield of the Common Info field indicates in units of dBm, the AP’s combined transmit power at the antenna connectors of all the transmit antennas used to transmit the Trigger frame and normalized to 20 MHz bandwidth (20521)  ~~the combined average power per 20 MHz bandwidth referenced to the antenna connector, of all antennas used to transmit the Trigger frame~~. The transmit power is reported with a resolution of 1 dB, with values in the range 0 to 60 representing -20 dBm to 40 dBm, respectively. Values above 60 are reserved.

***To TGax editor:***  *Make the following redline change on Pg/Ln 81/5*

The AP Tx Power subfield indicates in units of dBm, the AP’s combined transmit power at the antenna connectors of all the transmit antennas used to transmit the HE SU PPDU, HE ER SU PPDU, or HE MU PPDU that solicits the HE TB PPDU, and normalized to 20 MHz bandwidth. (20521) ~~the AP transmit power, in dBm, referenced to the antenna connector, combined over all transmit antennas and normalized to 20 MHz bandwidth, used for the HE SU PPDU, HE ER SU PPDU, or HE MU PPDU that solicits the HE TB PPDU.~~ The transmit power, $P\_{TX}$, is calculated as $P\_{TX}=-20+2×F\_{Val}$, $F\_{Val}$ is the value the AP Tx Power subfield, except for the value 31, which is reserved.

***------------- End Text Changes ---------------***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20522 | 111.26 | "The UL Target RSSI subfield of the User Info field indicates the expected receive signal power, averaged over the AP's antenna connectors, for the HE TB PPDU transmitted on the assigned RU." needs to be clearer that this is about the RSSI over the PPDU bandwidth (unlike AP Tx Power) [powerprecorr] | Change the cited text at the referenced location to "The UL Target RSSI subfield of the User Info field indicates the expected RSSI, in dBm, over the PPDU bandwidth, averaged over the AP's antenna connectors, for the HE TB PPDU transmitted on the assigned RU."At 76.26 change "The UL Target RSSI subfield indicates, in units of dBm, the expected receive power at the AP (i.e., averaged RSSI over all the AP's antennas) for the HE TB PPDU transmitted on the assigned RU." to "The UL Target RSSI subfield indicates the expected RSSI, in dBm, over the PPDU bandwidth, averaged over the AP's antenna connectors, for the HE TB PPDU transmitted on the assigned RU." and in the next sentence change "The target receive power" to "The target RSSI, <italics>Target<subscript>RSSI</subscript></italics>," | Reject –A Trigger frame can be sent in non-HT DUP format and hence AP Tx Power normalized to 20 MHz bandwidth. On the other hand, an AP is aware of the bandwidth (corresponding to the allocated RUs) of the solicited HE TB PPDU thereby normalization to bandwidth is not relevant. Furthermore, the HE TB PPDU bandwidth is greater than or equal to the bandwidth corresponding to the allocated RUs. Hence, an UL Target RSSI that is normalized to HE TB PPDU bandwidth changes the meaning of this subfield. |

***Discussion***

In 27.3.14 (Transmit requirements for an HE TB PPDU), the $Target\_{RSSI}$ represents the target receive signal power averaged over the AP’s antenna connectors for the HE TB PPDU. $Target\_{RSSI}$ is the value, in dBm, of UL Target RSSI subfield of User Info field in Trigger frame, the encoding of which is specified in Table 9-21h (UL Target RSSI subfield encoding).

A Trigger frame can be sent in non-HT DUP format and hence AP Tx Power normalized to 20 MHz bandwidth. On the other hand, an AP is aware of the bandwidth (corresponding to the allocated RUs) of the solicited HE TB PPDU thereby normalization to bandwidth is not relevant. Furthermore, the HE TB PPDU bandwidth is greater than or equal to the bandwidth corresponding to the allocated RUs.

An UL Target RSSI that is normalized to HE TB PPDU bandwidth changes the meaning of this subfield.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CID | P.L | Comment | Proposed Change | Resolution |
| 20725 | 106.58 | Re CID 16043: the resolution is about the setting in the TB PPDU, but the comment was about the setting in the Trigger frame | Add normative text on how an AP sets the LDPC Extra Symbol Segment subfield | Reject—Section 27.3.11.5.2 (LDPC coding) describes setting of LDPC Extra symbol segment bit by the AP. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CID | P.L | Comment | Proposed Change | Resolution |
| 20858 | 105.46 | Re CID 15951: the issue has not been completely fixed | In 9.3.1.23 prepend "and is not using OFDMA, " before "in which case the MU-MIMO LTF Mode subfield is" | Reject –The description at the mentioned P.L covers all the cases, i.e.,The “in a non-OFDMA MU-MIMO…” line covers the case being pointed out in the proposed change. |

***Discussion***

*In section 9.3.1.23 (Trigger frame format),* The MU-MIMO LTF Mode subfield of the Common Info field indicates the LTF mode of the MU-MIMO HE TB PPDU response when the GI And LTF Type subfield of the Common Info field is set to indicate either 2x HE-LTF + 1.6 μs GI or 4x HE-LTF + 3.2 μs GI, in which case the MU-MIMO LTF Mode subfield is set to one of the following:

— In a non-OFDMA MU-MIMO HE TB PPDU the MU-MIMO LTF Mode subfield is set to indicate either HE single stream pilot HE-LTF mode or HE masked HE-LTF sequence mode.

— Otherwise, the MU-MIMO LTF Mode subfield is set to indicate HE single stream pilot HE-LTF mode. The MU-MIMO LTF Mode subfield encoding is defined in Table 9-31e (MU-MIMO LTF Mode subfield encoding).



If the GI And LTF Type subfield of the Common Info field is set to indicate 1x HE-LTF + 1.6 μs GI, the MU-MIMO LTF Mode subfield of the Common Info field is reserved. If a non-OFDMA MU-MIMO HE TB PPDU uses a 1x HE-LTF, then neither HE masked HE-LTF sequence mode nor HE single stream pilot HE-LTF mode are used.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CID | P.L | Comment | Proposed Change | Resolution |
| 20859 | 105.49 | "In a non-OFDMA MU-MIMO HE TB PPDU the MU-MIMO LTF Mode subfield " -- there is no such subfield in an HE TB PPDU | Revert the change made under CID 15954 in 18/1842r2 | Reject –Bit B22 in Common Info field of Trigger frame is “MU-MIMO LTF Mode”. MU-MIMO LTF Mode = HE Single stream pilot in OFDMA MU-MIMO HE TB PPDU andMU-MIMO LTF Mode = HE Single stream pilot of masked HE-LTF sequence mode in non-OFDMA MU-MIMO HE TB PPDU When LTF + GI = 2x + 1.6 and 4x + 3.2. If the GI And LTF Type subfield of the Common Info field is set to indicate 1x HE-LTF + 1.6 μs GI, the MU-MIMO LTF Mode subfield of the Common Info field is reserved. If a non-OFDMA MU-MIMO HE TB PPDU uses a 1x HE-LTF, then neither HE masked HE-LTF sequence mode nor HE single stream pilot HE-LTF mode are used. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20860 | 105.43 | Re CID 15954: the resolution does not address the comment, which was that the text (a) is behaviour and so should not be in Clause 9 and (b) is duplicative | Change from 105.43 to 106.4 to "The MU-MIMO LTF Mode subfield of the Common Info field indicates the LTF mode of the UL MU-MIMO non-OFDMA HE TB PPDU response when the GI And LTF Type subfield of the Common Info field is set to indicate either 2x LTF + 1.6 us GI or 4x LTF + 3.2 us GI, as defined in Table 9-25e. Otherwise, this subfield is reserved." (note that the "Otherwise" is the same thing as saying set to HE single stream pilot HE-LTF mode, since the value is 0) | Revised –Both (a) and (b) are valid points from commentor, i.e., 9.3.1.22 is describing behaviour aspects of MU-MIMO LTF Mode subfield and there is duplication in section 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield).TGax Editor: make changes for CID 20860 according to 11-19-1183-02-00ax. |
| 20861 | 105.43 | Re CID 15954: the resolution does not address the comment, which was that the text (a) is behaviour and so should not be in Clause 9 and (b) is duplicative | Change from 105.43 to 106.4 to "The MU-MIMO LTF Mode subfield of the Common Info field indicates the LTF mode of the UL MU-MIMO non-OFDMA HE TB PPDU response when the GI And LTF Type subfield of the Common Info field is set to indicate either 2x LTF + 1.6 us GI or 4x LTF + 3.2 us GI, as defined in Table 9-25e. Otherwise, this subfield is undefined." | Revised—Refer to resolution of CID 20860 |

***Discussion***

In 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield):

If an AP transmits a Trigger frame that allocates an RU that spans the entire HE TB PPDU bandwidth and assigns the RU to more than one non-AP STA (i.e., for UL MU-MIMO) and with the GI And LTF Type subfield of the Common Info field set to indicate either 2x HE-LTF + 1.6 μs GI or 4x HE-LTF + 3.2 μs GI, the AP may set the MU-MIMO LTF Mode subfield in the Common Info field of the Trigger frame to indicate either HE single stream pilot HE-LTF mode or HE masked HE-LTF sequence mode. Otherwise, the AP shall set the MU-MIMO LTF Mode subfield in the Common Info field to indicate HE single stream pilot HE-LTF mode.

In section 27.3.10.10 (HE-LTF): If the 1x HE-LTF is used for non-OFDMA UL MU-MIMO, the HE no pilot HE-LTF mode is used.

***------------- Begin Text Changes ---------------***

***To TGax editor:*** *Please make the redline change below on Pg/Ln: 110/23*

~~The MU-MIMO LTF Mode subfield of the Common Info field indicates the LTF mode of the MU-MIMO HE TB PPDU response when the GI And LTF Type subfield of the Common Info field is set to indicate either 2x HE-LTF + 1.6 μs GI or 4x HE-LTF + 3.2 μs GI, in which case the MU-MIMO LTF Mode subfield is set to one of the following:~~

~~— In a non-OFDMA MU-MIMO HE TB PPDU the MU-MIMO LTF Mode subfield is set to indicate either HE single stream pilot HE-LTF mode or HE masked HE-LTF sequence mode.~~

~~— Otherwise, the MU-MIMO LTF Mode subfield is set to indicate HE single stream pilot HE-LTF mode. The MU-MIMO LTF Mode subfield encoding is defined in Table 9-31e (MU-MIMO LTF Mode subfield encoding).~~

~~If the GI And LTF Type subfield of the Common Info field is set to indicate 1x HE-LTF + 1.6 μs GI, the MU-MIMO LTF Mode subfield of the Common Info field is reserved. If a non-OFDMA MU-MIMO HE TB PPDU uses a 1x HE-LTF, then the HE no pilot HE-LTF mode is used (#21214).~~

The MU-MIMO LTF Mode subfield of the Common Info field indicates the LTF mode of the UL MU-MIMO non-OFDMA HE TB PPDU response when the GI And LTF Type subfield of the Common Info field is set to indicate either 2x LTF + 1.6 us GI or 4x LTF + 3.2 us GI, as defined in Table 9-31 (GI And LTF Type subfield encoding). Otherwise, this subfield is set to HE single stream pilot HE-LTF mode. (#20860)

***------------- End Text Changes ---------------***