IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Resolutions to various CIDs in Trigger Frame format | | | | |
| Date: March 2, 2018 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm Inc. |  |  | aasterja@qti.qualcomm.com |
| George Cherian | Qualcomm Inc. |  |  | gcherian@qti.qualcomm.com |

Abstract

This submission proposes resolutions for following CID received for TGax LB230 (24):

11514, 14349, 11924, 11372, 11538, 13539, 12720, 11539, 12806, 11541, 12873, 13332, 13085, 11915, 12376, 11981, 11738, 13846, 11982, 12377, 12355, 13334, 12378

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised based on feedback during MAC ad-hoc (3/1/18)
  + Removed CID 13329

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg / Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 11514 | Chunyu Hu | 85.22 | 9.3.1.23 | In response to a basic trigger frame, the non-AP STA can put not only acknowledge frame (ACK/BA/MBA) in HE\_TB, but also DATA frame if the duration is long enough. But then it'll be doing cacaded MU frame sequence which may not be what AP intends to. Propose to add a new field to allow AP explicitly specify desired response (allow non QoS-NULL DATA or not.) | as in the comment | Reject  The Trigger Dependent User Info field of Basic Trigger carries TID Aggregation Limit subfield which already provides this functionality. AP can use this subfield to indicate the desired response. |
| 14349 | Zhou Lan | 85.22 | 9.3.1.23 | In the basic trigger there should be option to limit the type of frame that can be contained in the TB PPDU. For example, limiting the response TB PPDU only contains ACK/BA/MBA. | as in the comment | Reject  The Trigger Dependent User Info field of Basic Trigger carries TID Aggregation Limit subfield which already provides this functionality. AP can use this subfield to indicate the desired response. |
| 11924 | Ian Sherlock | 85.35 | 9.3.1.23 Trigger frame format | The trigger frame is a control frame and as such should use control frame PHY rates. There is no limitation on using HR/DSSS PHY rates for control frames. However, receiving a trigger frame at a HR/DSSS PHY rate is problematic for accurate frequency tracking as required for the HE TB PPDU response | Add explicit text prohibiting the usage of HR/DSSS PHY rates for 11ax trigger frames | Revised  Agree with the comment – however, this already specified in section 27.5.3.2.3.  **TGax editor: No further changes are needed.** |
| 11372 | Bibhu Mohanty | 86.43 | 9.3.1.23 | Several fields in the Common Info field of the TF indicate the property of the response frame (i.e., HE TB PPDU) and not the property of the TF itself, rename them to be more representative of their intended purpose (for example, the Length field doesn't indicate the length of TF rather the L-SIG length field of the HE TB PPDU) | As in comment | Revised  Agree with the comment.  **TGax editor please update the subfield names as indicated in doc 11-18/0366r1 for Figure 9-52d and Figure 9-52g throughout the draft.** |
| 11538 | Dorothy Stanley | 86.43 | 9.3.1.23 | include a reference to how to calculate Length | as in comment | Reject  An HE AP determines the length of the HE TB PPDU and indicates the value in the Length field. Responding STAs set the L-SIG LENGTH field of their HE TB PPDU to this value. |
| 13539 | SUNGEUN LEE | 87.46 | 9.3.1.23 | triggered UL PPDU is not the accurate terminology | Change 'triggered UL PPDU' to 'corresponding HE TB PPDU' | Revised  Agree with the comment. The incorrect terminology doesn’t appear in D2.2 as it was fixed in doc 11-18/0065r2 as a resolution to CIDs 13694, 13861.  **TGax editor: No further changes are needed.** |
| 12720 | Mark RISON | 88.08 | 9.3.1.23 | "B25 of the Number OF HE-LTF Symbols And Midamble Periodicity subfield indicates midamble periodicity in the same HE TB PPDU" -- indicates it how? | Add ": 0 for a period of 10 symbols and 1 for a period of 20 symbols" | Revised  Agree with the comment. Added a sentence to cover the two values and their representation.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
|  |  |  |  |  |  |  |
| 11539 | Dorothy Stanley | 88.14 | 9.3.1.23 | I can't find a definition or equation for N\_STS,total. And include a reference to how to specifically calculate the number of HE-LTF symbols. | as in comment | Revised  Agree with the comment. The missing definition is included in D2.2 as a resolution to CID 11545.  **TGax editor: No further changes are needed.** |
| 12806 | Mark RISON | 88.15 | 9.3.1.23 | Broken reference | Change Table 21-13 to Table 28-19 | Revised  Agree with the comment. The incorrect reference is fixed in D2.2  **TGax editor: No further changes are needed.** |
| 11541 | Dorothy Stanley | 88.18 | 9.3.1.23 | I can't find a definition or equation for N\_STS,total. And include a reference to how to specifically calculate the number of HE-LTF symbols. | as in comment | Revised  Agree with the comment. The missing definition is included in D2.2 as a resolution to CID 11545.  **TGax editor: No further changes are needed.** |
| 12873 | Mark RISON | 88.45 | 9.3.1.23 | "Values 0 to 60 map to -20 dBm to 40 dBm" is not clear | Delete Table 9-25f and change "The AP Tx Power subfield encoding is defined in Table 9-25f (AP Tx Power subfield encoding)." to "The AP Tx Power subfield contains the AP Tx power in dBm plus 20; values above 60 are reserved." | Reject  Since the range extends from -20dBm to +40dBm, it is better to keep the table to clearly show the mapping for the range of values. |
| 13332 | ron porat | 89.55 | 9.3.1.23 | Reference missing to where conditions for presence of Trigger Dependent Common Info are specified. | Add reference to 9.3.1.23.1-9.3.1.23.8 | Revised  Agree with the comment. Added reference to section on various TF variants.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
| 13085 | Patrice Nezou | 89.63 | 9.3.1.23 | An AID12 subfield that is 2046 indicates an unassigned RU (see 27.5.3.2.3 (Allowed settings of the Trigger frame fields and UMRS Control field)). What is the usage of signalling RU with 2046 ? Overhead is saved by using only one user info field for multiple random access RU and extra overhead is inserted with this AID 2046. | Please precise the meaning of AID 2046. | Reject  An AP may be experiencing interference on a particular RU or a narrow band of frequencies and therefore cannot receive UL traffic on those RUs. As such AP may signal unassigned RUs via 2046. Therefore, such RUs can’t be use for random access. |
| 11981 | James Yee | 91.33 | 9.3.1.23 | For clarity, change "code type" to "FEC encoding code type" | As suggested. | Revised  Agree with the comment.  **TGax editor please update the subfield names as indicated doc 11-18/0366r1 for Figure 9-52g throughout the draft.** |
| 11738 | Geonjung Ko | 91.26 | 9.3.1.23 | When the value of the AID12 field is 0 or 2045, the spec does not mention the encoding of the RU Allocation subfield. So it is unclear if it follows the Table 9-25h. It is required to define the encoding of the RU Allocation subfield. | As in the comment | Revised  Agree with the comment. Reorganized the text to clarify that the RU allocation for RA-RU case is the same as a directed RU.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
| 13846 | Yonggang Fang | 92.26 | 9.3.1.23 | What size of RU is used for random access? 26-tone RU? | Please clarify | Revised  Agree with the comment that RU allocation for RA-RU case was not clear. Please see resolution to CID 11738.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
| 11915 | Huizhao Wang | 90.18 | 9.3.1.23 | missing the indication of "RU Allocation field", when describing the bit 12 | Change to "The first bit of RU Allocation field" | Revised  Agree with the comment. The missing definition is included in D2.2 as a resolution to CID 12165.  **TGax editor: No further changes are needed.** |
| 12376 | Liwen Chu | 90.19 | 9.3.1.23 | B12 when RU is 2x996 is missing. | Add the following text in proper place: The first bit, B12, is set to 1 to indicate that the allocated RU is located within both the primary 80 MHz and the secondary 80 MHz. | Revised  Agree with the comment. Added the missing description at the beginning of the paragraph  **TGax editor: No further changes are needed.** |
| 11982 | James Yee | 92.10 | 9.3.1.23 | Reference to "Figure 9-52h" should be to "Figure 9-52i" | As suggested. | Revised  Agree with the comment. The incorrect reference was fixed in D2.2.  **TGax editor: No further changes are needed.** |
| 12377 | Liwen Chu | 92.31 | 9.3.1.23 | The target RSSI should also be normalized to 20MHz. | Change the text per the comment. | Revised  STA can computed it’s TxPower based on Target RSSI + pathloss. Since there are many possibilities of RU size when Target RSSI is normalized to 20MHz, the STA needs to apply an extra step (i.e., RUsize/20MHz) to compute the TxPower. This extra step can be avoided by not normalizing to 20MHz. Added text to clarify that the Target RSSI is expected signal level for the assigned RU.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
| 12355 | Liwen Chu | 60.16 | 9.2.4.6.4.2 | it should be Normolized to 20MHz. | As in comment | Revised  Please see resolution for CID 12377. Added text to clarify that the Target RSSI is expected signal level for the assigned RU.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
| 13334 | ron porat | 92.59 | 9.3.1.23 | Reference missing to where conditions for presence of Trigger Dependent User Info are specified. | Add reference to 9.3.1.23.1-9.3.1.23.8 | Revised  Agree with the comment. Added reference to section on various TF variants.  **TGax editor, please make changes as shown in doc 11-18/0366r1** |
| 12378 | Liwen Chu | 93.03 | 9.3.1.23 | Change "an exampleof how to compute the length, LPAD,MAC, of the Padding field (if present) to meet the duration requirements is given below" to "the method of how to compute the length, LPAD,MAC, of the Padding field in Trigger frame (if present) to meet the duration requirements is given below". | As in comment | Revised  Agree with the comment. Revised text to indicate that if Padding field is present in Trigger frame, the length is computed as shown in equations (9-0 & 9-0c).  **TGax editor, please make changes as shown in doc 11-18/0366r1** |

* **Trigger frame format**

***TGax Editor: Please replace all occurrences of the subfield names throughout the draft (field names and figure/table/section titles included) with the new names as shown in the figure below:***

[11372]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0    B3 | B4   B15 | B16 | B17 | B18 B19 | B20   B21 | B22 | B23                B25 |
|  | Trigger Type | UL Length | More TF | CS  Required | UL BW | GI And LTF Type | MU-MIMO LTF Mode | Number Of HE-LTF Symbols And Midamble Periodicity |
| Bits: | 4 | 12 | 1 | 1 | 2 | 2 | 1 | 3 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B26 | B27 | B28   B33 | B34   B36 | B37    B52 | B53 | B54    B62 | B63 |  |
|  | UL STBC | LDPC Extra Symbol Segment | AP TX Power | UL Packet Extension | UL Spatial Reuse | Doppler | UL HE-SIG-A2 Reserved | Reserved | Trigger Dependent Common Info |
| Bits: | 1 | 1 | 6 | 3 | 16 | 1 | 9 | 1 | variable |
| * **Common Info field** | | | | | | | | | |

***TGax Editor: Please make the following changes to the paragraphs below in section 9.3.1.23:***

[11ax D2.2, P89L6]

If the Doppler subfield of the Common Info field is 1, then B23-B24 of the Number Of HE-LTF Symbols And Midamble Periodicity subfield indicates the number of HE-LTF symbols present in the HE TB PPDU that is the response to the Trigger frame, and B25 of the Number OF HE-LTF Symbols And Midamble Periodicity subfield indicates midamble periodicity in the same HE TB PPDU. B25 is set to 0 to indicate a midamble periodicity of 10 symbol and set to 1 to indicate a midamble periodicity of 20 symbols. [12720]

~~[11ax D2.2, P89L12]~~

~~For a [13329]HE TB PPDU with MU-MIMO, the number of HE-LTF symbols is a function of the total number of space-time streams,~~ *~~N~~~~STS~~* ~~defined in Table 28-15 (Frequently used parameters), and the encoding of the Number Of HE-LTF Symbols And Midamble Periodicity subfield is defined in Table 28-19 (HE-SIG-A field of an HE MU PPDU).~~

[11ax D2.2, P89L30]

The LDPC Extra Symbol Segment subfield of the Common Info field indicates the status of the LDPC extra symbol segment. It is set to 1 if LDPC extra symbol segment is present [#Ed]in the HE TB PPDU that is the response to the Trigger frame and set to 0 otherwise.

[11ax D2.2, P90L54]

The Trigger Dependent Common Info subfield in the Common Info field is optionally present based on the value of the Trigger Type field (see 9.3.1.23.1 (Basic Trigger Variant) to 9.3.1.23.8 (NDP Feedback Report Poll (NFRP))). [13332]

***TGax Editor: Please replace all occurrences of the subfield names throughout the draft (field names and figure/table/section titles included) with the new names as shown in the figure below:***

[11372, 11981]

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0   B11 | B12    B19 | B20 | B21  B24 | B25 | B26            B31 | B32     B38 | B39 |  |
|  | AID12 | RU  Allocation | UL FEC Coding Type | UL MCS | UL DCM | SS Allocation / RA-RU Information | UL Target RSSI | Reserved | Trigger Dependent User Info |
| Bits: | 12 | 8 | 1 | 4 | 1 | 6 | 7 | 1 | variable |
| * **User Info field** | | | | | | | | | |

[11ax D2.2, P91L17]

[11738, 13846]If the value of the AID12 subfield is from between 1 to 2007, then the RU Allocation subfield of the User Info field indicates the RU used by the HE TB PPDU of the STA identified by the AID12 subfield. If the AID12 field is 2046, then the RU Allocation subfield indicates the location of an unassigned RU.The first bit, B12, is set to 0 to indicate that the allocated RU is located within the primary 80 MHz and is set to 1 to indicate that the allocated RU is located within the secondary 80 MHz. The mapping of the subsequent 7 bits, B19-B13, to the RU allocation is defined in Table 9-25h (The encoding of B19–B13 of the RU Allocation subfield).

[11ax D2.2, P92L24]

[11738, 13846]If there is more than one RA-RU, the sizes of all RA-RUs are the same and equal to the size of the first RU. Further, all the remaining subfields of the User Info field apply to all the RA-RUs.

[11ax D2.2, P91L50]

[11915, 12376]B12 is set to 0 for 20 MHz, 40 MHz and 80 MHz PPDUs, and is set to 0 to indicate that the RU allocation applies to primary 80 MHz or set to 1 to indicate that the RU allocation applies to secondary 80 MHz when the PPDU is 80+80 MHz and 160 MHz. The mapping of subsequent 7 bits indices B19-B13 to RU index in each row depends on the BW subfield in Common Info field:

* For a 20 MHz PPDU, the mapping of B19-B13 to RU allocation follows the RU index in Table 28-6 (Data and pilot subcarrier indices for RUs in a 20 MHz HE PPDU) in increasing order.
* The value 0 indicates 26-tone RU1 [121: 96], the value 8 indicates 26-tone RU9 [96: 121], and the values 9–36 are not used.
* The value 37 indicates 52-tone RU1 [121: 70], the value 40 indicates 52-tone RU4 [70: 121], and the values 41–52 are not used.
* The value 53 indicates 106-tone RU1 [122: 17], the value 54 indicates 106-tone RU2 [17: 122], and the values 55–60 are not used.
* The value 61 indicates 242-tone RU1 [122: 2, 2:122], and the values 62–64 are not used.
* For a 40 MHz PPDU, the mapping of B19-B13 to RU allocation follows the RU index in Table 28-7 (Data and pilot subcarrier indices for RUs in a 40 MHz HE PPDU) in increasing order.
* The value 0 indicates 26-tone RU1 [243: 218], the value 17 indicates 26-tone RU18 [218: 243], and the values 18–36 are not used.
* The value 37 indicates 52-tone RU1 [243: 192], the value 44 indicates 52-tone RU8 [192: 243], and the values 45–52 are not used.
* A similar ordering is followed for 106-tone RU, 242-tone RU and 484-tone RU.
* For an 80 MHz, 160 MHz and 80+80 MHz PPDU, the mapping of B19-B13 to RU allocation follows the RU index in Table 28-8 (Data and pilot subcarrier indices for RUs in an 80 MHz HE PPDU) in increasing order.
* The value 0 indicates 26-tone RU1 [499: 474], and the value 36 indicates 26-tone RU37 [474: 499].
* The value 37 indicates 52-tone RU1 [499: 448], and the value 52 indicates 52-tone RU16 [448: 499].
* A similar ordering is followed for 106-tone RU, 242-tone RU, 484-tone RU and 996-tone RU. For a 160 MHz and 80+80 MHz PPDU, B19-B13 are 68 indicates 2x996-tone RU and B12 is reserved and set to 1 to indicate a 2x996-tone-tone RU.

[11ax D2.2, P93L36]

[12377]The Target RSSI subfield of the User Info field indicates the expected receive signal power for the assigned RU averaged over the AP's antenna connectors for the HE TB PPDU that is the response to the Trigger frame. The resolution for the Target RSSI subfield in the User Info field is 1 dB. The Target RSSI subfield encoding is defined in Table 9-25i (Target RSSI subfield encoding).

[11ax D2.2, P93L58]

The Trigger Dependent User Info subfield in the User Info field is optionally present based on the value of the Trigger Type field (see 9.3.1.23.1 (Basic Trigger Variant) to 9.3.1.23.8 (NDP Feedback Report Poll (NFRP))). [13334]

[11ax D2.2, P93L61]

The Padding field is optionally present in a Trigger frame to extend the frame length to give the recipient STAs enough time to prepare a response for transmission a SIFS after the frame is received. The Padding field of the Trigger frame, if present, is at least two octets in length and is set to all 1s. The start of the Padding field is identified by the value 4095 in the AID12 subfield of a User Info field that would otherwise be present. An AP can use any type of padding to satisfy the duration requirement (see 27.5.3.2.2 (Padding for Trigger frame or frame containing UMRS Control subfield)). If Padding field is present in a Trigger frame, it’s length (in octets) *LPAD,MAC*, can be computed as shown below to satisfy the *MinTrigProcTime* (see Table 9-262z) specified by the non-AP STAs that are the recipients of the Trigger frame (see 27.5.3.2.2 (Padding for Trigger frame or frame containing UMRS Control subfield)).[12378]

* UMRS Control

***TGax Editor: Please make the following changes to the 5th paragraphs as shown below:***

[12355]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 assigned RU when the STA transmits the HE TB PPDU. The target receive power is calculated as *TargetRSSI* = 90 + 2×*FVal*, where *FVal* is the value of the UL Target RSSI subfield, except that the value 31 indicates to the STA to transmit at maximum power for the assigned MCS.