### IEEE P802.11Wireless LANs

|  |
| --- |
| Proposed Draft Specification for Trigger frame for EHT |
| Date: 2021-03-02 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Steve Shellhammer | Qualcomm |  |  | shellhammer@ieee.org |
| Yanjun Sun | Qualcomm |  |  | yanjuns@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm Inc |  |  | aasterja@qti.qualcomm.com |
| Myeongjin Kim | Samsung |  |  | mj1108.kim@samsung.com |
| Mengshi Hu | Huawei |  |  | humengshi@huawei.com |
| Cheng Chen | Intel |  |  | cheng.chen@intel.com |
| Lei Huang | Oppo |  |  | huang.lei1@oppo.com |
| Xiandong Dong | Xiaomi |  |  | dongxiandong@xiaomi.com |
| Jonghun Han | Samsung |  |  | jong\_hun.han@samsung.com |
| Jinyoung Chun | LGE |  |  | jiny.chun@lge.com |
| Greg Geonjung Ko | Wilus |  |  | greg.ko@wilusgroup.com |
| Zhiqiang Han | ZTE |  |  | han.zhiqiang1@zte.com.cn |
| Xiaofei Wang | Interdigital |  |  | xiaofei.wang@interdigital.com |
| Mark Rison | Samsung |  |  | m.rison@samsung.com |
| Junghoon Suh | Huawei |  |  | junghoon.suh@huawei.com |
| Kaiying Lv | Mediatek |  |  | Kaiying.Lu@mediatek.com |
| Yonggang Fang | ZTE |  |  | yfang@ztetx.com |
| Insun Jang | LGE |  |  | insun.jang@lge.com |
| Rojan Chitrakar | Panasonic |  |  | rojan.chitrakar@sg.panasonic.com |
| Hanqing Lou | Interdigital |  |  | hanqing.lou@interdigital.com |

Abstract

We propose draft text for Draft 0.4

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Incorporated additional corrections from TTT member
* Rev 2: Small edits during review on Joint call and added Comments based on feedback to address in the next revision

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 subsequent TGbe Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

**Discussion:**

802.11be reuses the trigger type of 802.11ax.

* All the Per User Info fields in a Trigger frame other than MU-BAR trigger shall have the same size.

[Motion 135, #SP226, [48] and [310]]*[#M1]*

The same Trigger frame can be used to solicit the TB PPDU from both the HE STA(s) and EHT STA(s).

[Motion 135, #SP228, [48] and [311]]*[#M2]*

A Trigger frame includes the signalling that indicates TB PPDU format to be used.

* The fields between Common Info field and User Info field that includes the signalling is TBD.

[Motion 135, #SP230, [48] and [312]]*[#M3]*

The UL HE SIG-A2 Reserved field is used to carry the information of the Trigger frame for soliciting EHT TB PPDU.

* The field name can be revised in Trigger frame for soliciting EHT TB PPDU.

[Motion 135, #SP227, [48] and [310]]*[#M4]*

802.11be has one unified RU allocation table (for both SU and MU) for the RU allocation field in the User Info field of the Trigger frame in R1.*[#M5]*

[Motion 135, #SP229, [48] and [311]]

An EHT AP shall set the UL Length subfield of a Trigger frame to the value given by the following equation with *m* = 2 if the Trigger frame is to solicit EHT TB PPDU:



For an EHT STA:

* if the EHT STA is solicited to transmit HE TB PPDU, then the LENGTH field in L-SIG field shall be equal to UL length in the Trigger frame for an HE TB PPDU;
* if the EHT STA is solicited to transmit EHT TB PPDU, then the Length field in L-SIG field shall be equal to UL length in the Trigger frame + 2 for an EHT TB PPDU.

This is for R1.

[Motion 144, #SP326, [35] and [313]]*[#M7]*

In the User Info Field of the Trigger frame, the following bits indicate the following:

* B0 of the RU Allocation subfield indicates Primary/Secondary 80 MHz Channel for RU/MRU $\leq $ 80 MHz, for P160.
	+ NOTE 1 – This is the same as in 802.11ax.
	+ NOTE 2 – For RUs/MRUs > 80 MHz, B0 is used to indicate a specific MRU and does not have a primary/secondary meaning.
* PS160 (B39) indicates Primary/Secondary 160 MHz for RU/MRU $\leq $ 160 MHz.
	+ NOTE 3 – For RUs/MRUs > 160 MHz, PS160 is used to indicate a specific MRU and does not have a primary/secondary meaning.
* For S160, the definition of B0 is TBD, for RU/MRU ≤ 80MHz.

[Motion 146, #SP350, [23] and [314]]*[#M8]*

The following entries are included in the RU Allocation table of the Trigger frame.

|  |  |  |
| --- | --- | --- |
| **B7-B1 of****the RU Allocation subfield** | **MRU** | **MRU Index** |
| 69 | RU996x4 | RU1 |
| 70–75 | MRU26+52 | MRU1 to MRU6, respectively |
| 76 | Reserved |  |
| 77–80 | MRU26+52 | MRU8 to MRU11, respectively |
| 81 | Reserved |  |
| 82–86 | MRU26+106 | MRU1 to MRU5, respectively |
| 87–88 | Reserved |  |
| 89 | MRU26+106 | MRU8 |
| 90–93 | MRU484+242 | MRU1 to MRU4, respectively |

[Motion 150, #SP355, [92] and [314]]*[#M9]*

The following entries are included in the RU allocation table of the Trigger frame.



* B0 and B7–B1 indicate MRU within 160 MHz.
* PS160 indicates which 160 MHz.

[Motion 146, #SP351, [23] and [314]]*[#M10]*

The following entries are included in the RU allocation table of the Trigger frame.



* B0 and B7–B1 indicate MRU within 160 MHz.
* PS160 indicates which 160 MHz.

[Motion 146, #SP352, [23] and [314]] *[#M11]*

The following entries are included in the RU Allocation table of the Trigger frame.



[Motion 150, #SP356, [92] and [314]] *[#M12]*

The following entries are included in the RU Allocation table of the Trigger frame.



[Motion 150, #SP357, [92] and [314]] *[#M13]*

The following entries are included in the RU Allocation table of the Trigger frame.



[Motion 150, #SP358, [92] and [314]] *[#M14]*

Design of the RU Allocation table of the Trigger frame is shown as follows.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **RU Allocation subfield** | **BW subfield** | **RU size** | **RU index 802.11ax** | **RU index 802.11be** | **PHY RU index 802.11be**  | **Details: 1) RU numbering in the context of the 80 MHz segment where the RU starts.2) RU numbering starts with 1, as in 802.11ax RU allocation numbers** |
| **PS160** | **B0** | **B7–B1** |
| 0–3:80 MHz segment where the RU is located | 0–8 | 20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz | 26 | RU1 – RU9 | 37×N + RU index 802.11be | 26-tone RU:- 802.11ax: 1, ..., 37, RU19 is the DC RU in 80 MHz- 802.11be: 1, ..., 18 for lower 40 MHz and 20–37 in upper 40 MHz. RU19 does not exist. |
| 9–17 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | RU10 – RU18 |
| 18 | 80 MHz, 160 MHz, 320 MHz | RU19 | reserved |
| 19–36 | 80 MHz, 160 MHz, 320 MHz | RU20 – RU37 |
| 37–40 | 20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz | 52 | RU1– RU4 | 16×N + RU index 802.11be | Same numbering for 802.11ax and 802.11be |
| 41–44 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | RU5 – RU8 |
| 45–52 | 80 MHz, 160 MHz, 320 MHz | RU9 – RU16 |
| 53, 54 | 20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz | 106 | RU1 – RU2 | 8×N + RU index 802.11be |
| 55, 56 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | RU3 – RU4 |
| 57–60 | 80 MHz, 160 MHz, 320 MHz | RU5 – RU8 |
| 61 | 20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz | 242 | RU1 | 4×N + RU index 802.11be |
| 62 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | RU2 |
| 63, 64 | 80 MHz, 160 MHz, 320 MHz | RU3 – RU4 |
| 65 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | 484 | RU1 | 2×N + RU index 802.11be |
| 66 | 80 MHz, 160 MHz, 320 MHz | RU2 |
| 67 | 80 MHz, 160 MHz, 320 MHz | 996 | RU1 | N + RU index 802.11be |
| **160 MHz segment where the RU is located** | 0 | 68 | reserved | reserved |
| 1 | 160 MHz, 320 MHz | 2×996 | RU1 | LU160 + RU index 802.11be |
| 0 | 0 | 69 | reserved | reserved | reserved |
| 0 | 1 |
| 1 | 0 |
| 1 | 1 | 320 MHz | 4×996 | reserved | RU1 | RU1 | RU1 |
| 0–3:80 MHz segment where the RU is located | 70–72 | 20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz | RU52 + RU26 | reserved | MRU1 – MRU3 | 12×N + RU index 802.11be | - MRU1: RU2 (26T) + RU2 (52T) - reserved for BW ≥ 80 MHz- MRU2: RU5 (26T) + RU2 (52T)- MRU3: RU8 (26T) + RU3 (52T) |
| 73–75 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | reserved | MRU4 – MRU6 | - MRU4: RU11 (26T) + RU6 (52T)- MRU5: RU14 (26T) + RU6 (52T)- MRU6: RU17 (26T) + RU7 (52T) - reserved for BW ≥ 80 MHz |
| 76–81 | 80 MHz, 160 MHz, 320 MHz | reserved | MRU7 –MRU12 | - MRU7: RU21 (26T) + RU10 (52T) - reserved- MRU8: RU24 (26T) + RU10 (52T)- MRU9: RU27 (26T) + RU11 (52T)- MRU10: RU30 (26T) + RU14 (52T)- MRU11: RU33 (26T) + RU14 (52T)- MRU12: RU36 (26T) + RU15 (52T) - reserved |
| 82–83 | 20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz | RU106 + RU26 | reserved | MRU1 – MRU2 | 8×N + RU index 802.11be | - MRU1: RU5 (26T) + RU1 (106T) - MRU2: RU5 (26T) + RU2 (106T) - reserved for BW ≥ 80 MHz |
| 84–85 | 40 MHz, 80 MHz, 160 MHz, 320 MHz | reserved | MRU3 – MRU4 | - MRU3: RU14 (26T) + RU3 (106T) - reserved for BW ≥ 80 MHz- MRU4: RU14 (26T) + RU4 (106T) |
| 86–89 | 80 MHz, 160 MHz, 320 MHz | reserved | MRU5 –MRU8 | - MRU5: RU24 (26T) + RU5 (106T)- MRU6: RU24 (26T) + RU6 (106T) - reserved- MRU7: RU33 (26T) + RU7 (106T) - reserved- MRU8: RU33 (26T) + RU8 (106T) |
| 90–93 | 80 MHz, 160 MHz, 320 MHz | RU484 + RU242 | reserved | MRU1 –MRU4 | 4×N + RU index 802.11be | - MRU1: RU2 (242T) + RU2 (484T)- MRU2: RU1 (242T) + RU2 (484T)- MRU3: RU4 (242T) + RU1 (484T)- MRU4: RU3 (242T) + RU1 (484T) |
| **160 MHz segment where the RU is located** | 0 | 94–95 | 160 MHz, 320 MHz | RU996 + RU484 | reserved | MRU1 – MRU2 | 4×LU160 + RU index 802.11be | - MRU1: RU2 (484T) + RU2 (996T)- MRU2: RU1 (484T) + RU2 (996T) |
| 1 | MRU3 –MRU4 | - MRU3: RU4 (484T) + RU1 (996T)- MRU4: RU3 (484T) + RU1 (996T) |
| 0 | 96–99 | 160 MHz, 320 MHz | RU996 + RU484 + RU242 | reserved | MRU1 – MRU4 | 8×LU160 + RU index 802.11be | - MRU1: RU2 (242T) + RU2 (484T) + RU2 (996T)- MRU2: RU1 (242T) + RU2 (484T) + RU2 (996T)- MRU3: RU4 (242T) + RU1 (484T) + RU2 (996T)- MRU4: RU3 (242T) + RU1 (484T) + RU2 (996T) |
| 1 | MRU5 – MRU8 | - MRU5: RU6 (242T) + RU4 (484T) + RU1 (996T)- MRU6: RU5 (242T) + RU4 (484T) + RU1 (996T)- MRU7: RU8 (242T) + RU3 (484T) + RU1 (996T)- MRU8: RU7 (242T) + RU3 (484T) + RU1 (996T) |
| 0 | 0 | 100–103 | 320 MHz | RU2×996 + RU484 | reserved | MRU1 – MRU4 | RU index 802.11be | - MRU1: RU2 (484T) + RU2 (996T) + RU3 (996T)- MRU2: RU1 (484T) + RU2 (996T) + RU3 (996T)- MRU3: RU4 (484T) + RU1 (996T) + RU3 (996T)- MRU4: RU3 (484T) + RU1 (996T) + RU3 (996T) |
| 0 | 1 | MRU5 – MRU6 | - MRU5: RU6 (484T) + RU1 (996T) + RU2 (996T)- MRU6: RU5 (484T) + RU1 (996T) + RU2 (996T)2 reserved entries for B7:B1 = 102, 103 |
| 1 | 0 | MRU7 – MRU8 | 2 reserved entries for B7:B1 = 100, 101- MRU7: RU4 (484T) + RU3 (996T) + RU4 (996T)- MRU8: RU3 (484T) + RU3 (996T) + RU4 (996T) |
| 1 | 1 | MRU9 – MRU12 | - MRU9: RU6 (484T) + RU2 (996T) + RU4 (996T)- MRU10: RU5 (484T) + RU2 (996T) + RU4 (996T)- MRU11: RU8 (484T) + RU2 (996T) + RU3 (996T)- MRU12: RU7 (484T) + RU2 (996T) + RU3 (996T)  |
| 0 | 0 | 104 | 320 MHz | RU3×996 | reserved | MRU1 | - MRU1: RU2 (996T) + RU2 (2×996T) |
| 0 | 1 | MRU2 | - MRU2: RU1 (996T) + RU2 (2×996T) |
| 1 | 0 | MRU3 | - MRU3: RU4 (996T) + RU1 (2×996T) |
| 1 | 1 | MRU4 | - MRU4: RU3 (996T) + RU1 (2×996T) |
| 0 | 0 | 105–106 | 320 MHz | RU3×996 + RU484 | reserved | MRU1 – MRU2 | - MRU1: RU2 (484T) + RU2 (996T) + RU2 (2×996T)- MRU2: RU1 (484T) + RU2 (996T) + RU2 (2×996T) |
| 0 | 1 | MRU3 – MRU4 | - MRU3: RU4 (484T) + RU1 (996T) + RU2 (2x996T)- MRU4: RU3 (484T) + RU1 (996T) + RU2 (2×996T) |
| 1 | 0 | MRU5 – MRU6 | - MRU5: RU6 (484T) + RU4 (996T) + RU1 (2×996T)- MRU6: RU5 (484T) + RU4 (996T) + RU1 (2×996T) |
| 1 | 1 | MRU7 – MRU8 | - MRU7: RU8 (484T) + RU3 (996T) + RU1 (2×996T)- MRU8: RU7 (484T) + RU3 (996T) + RU1 (2×996T) |
|   | 107–127 | reserved |

[Motion 150, #SP359, [92] and [315]]*[#M15]*

B0 bit in the S160 is defined as follows.

* B0 == 0 → Lower 80 MHz
* B0 == 1 → Upper 80 MHz

[Motion 150, #SP360, [92] and [315]]*[#M16]*

The formula and tables for the parameter 𝑁 in the Trigger Frame RU Allocation table are defined as follows.

* *N* = 2×X1+X0
* For UL BW ≤ 80MHz → PS160, B0, X0 and X1 are 0.
* For UL BW = 160MHz $\rightarrow $ PS160 and X1 = 0. X0 is specified in the following table.

|  |  |  |
| --- | --- | --- |
| **160 MHz channelization** | **Primary 80 MHz (B0 = 0)** | **Secondary 80 MHz (B0 = 1)** |
| [P80 S80] | X0 = 0 | X0 = 1 |
| [S80 P80] | X0 = 1 | X0 = 0 |

* For UL BW = 320 MHz $\rightarrow $ X0 and X1 are specified in the following table.

|  |  |  |
| --- | --- | --- |
| **320 MHz channelization** | **Primary 160 MHz (PS160 = 0)** | **Secondary 160MHz (PS160 = 1)** |
| Primary 80 MHz (B0 = 0) | Secondary 80 MHz (B0 = 1) | Lower 80 MHz(B0 = 0) | Higher 80 MHz(B0 = 1) |
| [P80 S80 S160] | [X1 X0] = [0 0] | [X1 X0] = [0 1] | [X1 X0] = [1 0] | [X1 X0] = [1 1] |
| [S80 P80 S160] | [X1 X0] = [0 1] | [X1 X0] = [0 0] | [X1 X0] = [1 0] | [X1 X0] = [1 1] |
| [S160 P80 S80] | [X1 X0] = [1 0] | [X1 X0] = [1 1] | [X1 X0] = [0 0] | [X1 X0] = [0 1] |
| [S160 S80 P80] | [X1 X0] = [1 1] | [X1 X0] = [1 0] | [X1 X0] = [0 0] | [X1 X0] = [0 1] |

[Motion 150, #SP361, [92] and [315]]*[#M17]*

The UL BW Extension field of the Tigger frame in R1 is defined as follows.

|  |  |  |  |
| --- | --- | --- | --- |
| **UL BW****(2 bits)** | **Bandwidth for HE TB PPDU (MHz)** | **UL BW Extension (2 bits)** | **Bandwidth for EHT TB PPDU (MHz)** |
| 0 | 20 | 0 | 20 |
| 0 | 20 | 1 | reserved |
| 0 | 20 | 2 | reserved |
| 0 | 20 | 3 | reserved |
| 1 | 40 | 0 | 40 |
| 1 | 40 | 1 | reserved |
| 1 | 40 | 2 | reserved |
| 1 | 40 | 3 | reserved |
| 2 | 80 | 0 | 80 |
| 2 | 80 | 1 | reserved |
| 2 | 80 | 2 | reserved |
| 2 | 80 | 3 | reserved |
| 3 | 160 | 0 | reserved |
| 3 | 160 | 1 | 160 |
| 3 | 160 | 2 | 320 -1 |
| 3 | 160 | 3 | 320 -2 |

[Motion 150, #SP383, [92] and [316]]*[#M18]*

In R1, an 1-bit HE/EHT indication in the common part of the Trigger frame is used to indicate to the EHT STA whether to transmit an HE or EHT TB PPDU within the primary 160 MHz.

* Use B54 (the first bit) of UL HE-SIG-A2 Reserved field to carry this HE/EHT indication.

NOTE – The EHT STA shall not transmit an HE TB PPDU on the secondary 160 MHz.

[Motion 150, #SP384, [92] and [316]]*[#M19]*

In a Trigger frame that solicits an EHT TB PPDU, a Special User Info field is placed immediately after the Common Info field and the Special User Info field carries the following non-derived subfields of the U-SIG in the TB PPDU:

* PHY Version ID (3 bits)
* PPDU Bandwidth Extension field (2 bits)
* Spatial Reuse 1 (4 bits)
* Spatial Reuse 2 (4 bits)
* U-SIG Reserved bits (12 bits)

The length of the Special User Info field is the same as that of the other User Info fields in the Trigger frame.

[Motion 150, #SP368, [92] and [322]]*[#M20]*

If the Special User Info field is not present in the Trigger frame, then the User Info field is the HE format and the EHT STA transmits an HE TB PPDU.

In R1, if the Special User Info field is present in the Trigger frame, the User Info field is the EHT Format and the EHT STA transmits an EHT TB PPDU.

[Motion 150, #SP369, [92] and [322]]*[#M21]*

The Special User Info field (that carries the non-derived subfields of the U-SIG) is identified by using the value 2007 in the AID12 subfield.

* An EHT AP shall not use the value 2007 as an association identifier (AID) for any STA.

[Motion 150, #SP370, [92] and [322]]*[#M22]*

There are two SR fields (4 bits each, total 8 bits), with granularity of half PPDU BW, but no smaller than 20 MHz, in the U-SIG of TB PPDU.

* Values in SR fields are defined as the same as in 802.11ax.

[Motion 150, #SP374, [92] and [323]]*[#M23]*

B25 in a User Info Field addressed to an EHT STA within a Trigger frame is reserved and is set to zero in R1.

* NOTE – In 802.11ax B25 is the DCM bit, which is not needed in 802.11be.

[Motion 150, #SP381, [92] and [324]]*[#M24]*

B39 in a User Info field addressed to an EHT STA within a Trigger frame is the Primary/Secondary 160 (PS160) subfield.

* NOTE – The PS160 subfield, along with B7-B0 of the RU Allocation subfield, specify the RU/MRU.

[Motion 150, #SP380, [92] and [324]*[#M25]*

Four bits of a User Info field addressed to an EHT STA within a Trigger frame for the Spatial Stream Allocation subfield are used to indicate the starting spatial stream, and two bits are used to indicate the number of per-user spatial streams.

* NOTE – This supports up to a total of sixteen spatial streams with up to four spatial streams per-user.

 

[Motion 150, #SP382, [92] and [324]] *[#M26]*

**Propose:**

### Trigger frame format

### 9.3.1.22.1 General

***Discussion: Proposed changes below are based on #M2, and #M7 among others. By generalizing we cover the case of HE TB PPDU generated by HE STAs and EHT STAs, EHT PPDUs generated by EHT STAs, and non-HT PPDUs (e.g., CTS frame) by HE/EHT STAs in response to MU-RTS Trigger. This is also inline with the other motion that passed which enables the MU-RTS Trigger frame to solicit one or more SU PPDUs (which might not be CTS frames) by an EHT STAs. Note that the explicit types of PPDUs generated by each variant of Trigger frame are covered in both subclauses that define the variants of the Trigger frames and also in the respective behavioral subclauses.***

***TGbe editor: Please change the paragraph below as follows:***

A Trigger frame allocates resources for and solicits one or more TB PPDU transmissions. The Trigger frame also carries other information required by the responding STA to send a PPDU in response to the Trigger frame.*(#M2)*

The format for the Trigger frame is defined in Figure 9-64a (Trigger frame format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | MAC header |  |  |  |  |
|  | Frame Control | Duration | RA | TA | Common Info | User Info List | Padding | FCS |
| Octets: | 2 | 2 | 6 | 6 | 8 or more | variable | variable | 4 |
| **9-64a Trigger frame format** |

The Duration field is set as defined in 9.2.5 (Duration/ID field (QoS STA)).

The RA field is set as follows:

* For a Trigger frame that is not a GCR MU-BAR, NFRP or MU-RTS Trigger frame, and that has one User Info field that is not a special User Info field (see 9.3.1.22.1.3 (Special User Info field)) and the AID12 subfield of the User Info field contains the AID of a non-AP STA, the RA field is set to the address of that STA
* For a Trigger frame that has at least one User Info field with the AID12 subfield that allocates an RA-RU, the RA field is set to the broadcast address
* For a Trigger frame that is not a GCR MU-BAR Trigger frame and that has more than one User Info field that is not a special User Info field (see 9.3.1.22.1.3 (Special User Info field)), the RA field is set to the broadcast address
* For a Trigger frame that is an NFRP Trigger frame or MU-RTS Trigger frame, the RA field is set to the broadcast address
* For a Trigger frame that is a GCR MU-BAR Trigger frame, the RA field is set to the MAC address of the group for which reception status is being requested

The TA field is the address of the STA transmitting the Trigger frame if the Trigger frame is addressed to STAs that belong to a single BSS. The TA field is the transmitted BSSID if the Trigger frame is addressed to STAs from at least two different BSSs of the multiple BSSID set. The rules for setting of the TA field are defined in 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield).

***Discussion: Adding new subclause headers to simplify readability and searching for main blocks of the Trigger frame.***

***TGbe editor: Please a new subclause header in this location as follows:***

### 9.3.1.22.1.1 Common Info field*(#Ed)*

The HE variant of the Common Info field is defined in Figure 9-64b (Common Info field format, HE variant).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 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 HE-LTF Type | MU-MIMO HE-LTF Mode | Number Of HE-LTF Symbols And Midamble Periodicity |
| Bits: | 4 | 12 | 1 | 1 | 2 | 2 | 1 | 3 |
|     | B26 | B27 | B28   B33 | B34   B35 | B36 | B37    B52 | B53 | B54    B62 |
|  | UL STBC | LDPC Extra Symbol Segment | AP Tx Power | Pre-FEC Padding Factor | PEDisambiguity | UL Spatial Reuse | Doppler | UL HE-SIG-A2 Reserved |
| Bits: | 1 | 1 | 6 | 2 | 1 | 16 | 1 | 9 |
|     | B63 |  |
|  | Reserved | Trigger Dependent Common Info |
| Bits: | 1 | variable |
| **Figure 9-64b--Common Info field format, HE variant** |

The EHT variant of the Common Info field is defined in Figure 9-64b2 (Common Info field format, EHT variant).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 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 EHT-LTF Type | MU-MIMO EHT-LTF Mode | Number Of EHT-LTF Symbols And Midamble Periodicity |
| Bits: | 4 | 12 | 1 | 1 | 2 | 2 | 1 | 3 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|     | B26 | B27 | B28   B33 | B34   B35 | B36 | B37    B52 | B53 | B54 | B55 |
|  | UL STBC | LDPC Extra Symbol Segment | AP Tx Power | Pre-FEC Padding Factor | PEDisambiguity | UL Spatial Reuse | Doppler | HE/EHT P160 | Special User Info Field Present |
| Bits: | 1 | 1 | 6 | 2 | 1 | 16 | 1 | 1 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
|     | B56 B62 | B63 |  |
|  | Reserved | Reserved | Trigger Dependent Common Info |
| Bits: | 7 | 1 | Variable |

|  |
| --- |
| **Figure 9-64b2--Common Info field format, EHT variant** |

The Trigger Type subfield identifies the Trigger frame variant and its encoding is defined in Table 9-31c (Trigger Type subfield encoding).

|  |
| --- |
| **Figure 831c-Trigger Type subfield encoding** |
| **Trigger Type subfield value** | **Trigger frame variant** |
| 0 | Basic |
| 1 | Beamforming Report Poll (BFRP) |
| 2 | MU-BAR |
| 3 | MU-RTS |
| 4 | Buffer Status Report Poll (BSRP) |
| 5 | GCR MU-BAR |
| 6 | Bandwidth Query Report Poll (BQRP) |
| 7 | NDP Feedback Report Poll (NFRP) |
| 8-15 | Reserved |

***Discussion: Change below addresses #M7, which specifies that the UL Length setting of the Trigger frame when the Trigger solicits an EHT TB PPDU as opposed to HE TB PPDU. The change here refers mainly to the respective normative behaviour subclauses since these are requirements. Note that the rules are essentially identical (i.e., independently of the solicited TB PPDU variant (HE or EHT). However, since the motion explicitly calls the EHT PPDU case out the proposal is to also add the normative requirement in the normative behaviour subclause that describes solicitation of EHT TB PPDUs.***

***TGbe editor: Change the paragraph below as follows:***

The UL Length subfield of the Common Info field indicates the value of the L-SIG LENGTH field of the solicited TB PPDU. The UL Length subfield is set:

* As defined in 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield) if the solicited PPDU is an HE TB PPDU.
* As defined in 35.4.2.2.1 ( Allowed settings of the Trigger frame fields and TRS Control subfield for EHT) if the solicited PPDU is an EHT TB PPDU.*(#M7)*

The More TF subfield of the Common Info field indicates whether or not a subsequent Trigger frame is scheduled for transmission. The More TF subfield is set as defined in 26.8.2 (Individual TWT agreements) and 26.8.3.2 (Rules for TWT scheduling AP).

The CS Required subfield of the Common Info field is set to 1 to indicate that the STAs identified in the User Info fields are required to use ED to sense the medium and to consider the medium state and the NAV in determining whether or not to respond. The CS Required subfield is set to 0 to indicate that the STAs identified in the User Info fields are not required to consider the medium state or the NAV in determining whether or not to respond. See 26.5.2.3 (Non-AP STA behavior for UL MU operation) and 26.5.2.5 (UL MU CS mechanism) for details.

The UL BW subfield of the Common Info field indicates the bandwidth in the HE-SIG-A of the HE TB PPDU and is defined in Table 9-31d (UL BW subfield encoding).

|  |
| --- |
| **Table 9-31d-UL BW subfield encoding** |
| **UL BW subfield value** | **Description** |
| 0 | 20 MHz |
| 1 | 40 MHz |
| 2 | 80 MHz |
| 3 | 80+80 MHz or 160 MHz |

The UL BW subfield of the Common Info field along with the UL BW Extension subfield of the Special User Info field indicates the bandwidth in the U-SIG of the EHT TB PPDU and is defined in Table 9-31k (UL BW Extension subfield encoding).

The GI And HE/EHT-LTF Type subfield of the Common Info field indicates the GI and HE/EHT-LTF type of the HE/EHT TB PPDU response. The GI And HE/EHT-LTF Type subfield encoding is defined in Table 9-31e (GI And HE/EHT-LTF Type subfield encoding).

|  |
| --- |
| **Table 9-31e-GI And HE/EHT-LTF Type subfield encoding** |
| **GI And HE/EHT-LTF Type subfield value** | **Description** |
| 0 | 1x HE/EHT-LTF + 1.6 µs GI |
| 1 | 2x HE/EHT-LTF + 1.6 µs GI |
| 2 | 4x HE/EHT-LTF + 3.2 µs GI |
| 3 | Reserved |
| **Table 9-31f-MU-MIMO HE-LTF Mode subfield encoding** |
| **MU-MIMO HE-LTF subfield value** | **Description** |
| 0 | HE single stream pilot HE-LTF mode |
| 1 | HE masked HE-LTF sequence mode |

The MU-MIMO HE-LTF Mode subfield of the Common Info field indicates the HE-LTF mode for an HE TB PPDU that has an RU that spans the entire bandwidth and that is assigned to more than one non-AP STA (i.e., for UL MU-MIMO) when the GI And HE-LTF Type subfield of the Common Info field indicates either 2x HE-LTF + 1.6 µs GI or 4x HE-LTF + 3.2 µs GI, as defined in Table 9-31e (GI And HE-LTF Type subfield encoding). Otherwise, this subfield is set to indicate HE single stream pilot HE-LTF mode. The MU-MIMO EHT-LTF Mode subfield of the Common Info field is reserved in a Trigger frame soliciting an EHT TB PPDU.

If the Doppler subfield of the Common Info field is 0, then the Number Of HE-LTF or EHT-LTF Symbols And Midamble Periodicity subfield of the Common Info field indicates the number of HE-LTF or EHT-LTF symbols present in the HE or EHT TB PPDU and is encoded as follows:

* 0 for 1 HE-LTF or EHT-LTF symbol
* 1 for 2 HE-LTF or EHT-LTF symbols
* 2 for 4 HE-LTF or EHT-LTF symbols
* 3 for 6 HE-LTF or EHT-LTF symbols
* 4 for 8 HE-LTF or EHT-LTF symbols
* 5-7 is reserved

If the Doppler subfield of the Common Info field is 1, then the Number Of HE-LTF Symbols And Midamble Periodicity subfield indicates the number of HE-LTF symbols and the periodicity of the midamble and is encoded as follows:

0 for 1 HE-LTF symbol and 10 symbol midamble periodicity

1 for 2 HE-LTF symbols and 10 symbol midamble periodicity

2 for 4 HE-LTF symbols and 10 symbol midamble periodicity

4 for 1 HE-LTF symbol and 20 symbol midamble periodicity

5 for 2 HE-LTF symbols and 20 symbol midamble periodicity

6 for 4 HE-LTF symbols and 20 symbol midamble periodicity

3 and 7 are reserved

The UL STBC subfield of the Common Info field indicates the status of STBC encoding for the solicited HE TB PPDUs. It is set to 1 to indicate STBC encoding and set to 0 otherwise.

The UL STBC subfield of the Common Info field is reserved in a Trigger frame soliciting an EHT TB PPDU.

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 the LDPC extra symbol segment is present in the solicited HE or EHT TB PPDUs and set to 0 otherwise.

The AP Tx Power subfield of the Common Info field indicates the AP’s combined transmit power at the transmit antenna connector of all the antennas used to transmit the triggering PPDU in units of dBm/20 MHz. The transmit power in dBm / 20 MHz, PTX, is calculated as PTX = –20 + FVal, where FVal is the value of the AP Tx Power subfield, except for the values above 60, which are reserved.

The Pre-FEC Padding Factor and PE Disambiguity subfields are defined in Table 9-31g (Pre-FEC Padding Factor and PE Disambiguity subfields) and have the same encoding as their respective subfields in HE SIG-A (see Table 27-20 (HE-SIG-A field of an HE MU PPDU)) or as in their respective subfields in EHT-SIG (see Table 36-24 (Common field for OFDMA transmission)).

|  |
| --- |
| **Table 9-31g-Pre-FEC Padding Factor and PE Disambiguity subfields** |
| **Subfield** | **Description** | **Encoding** |
| Pre-FEC Padding Factor | Indicates the pre-FEC padding factor | Set to 0 to indicate a pre-FEC padding factor of 4Set to 1 to indicate a pre-FEC padding factor of 1Set to 2 to indicate a pre-FEC padding factor of 2Set to 3 to indicate a pre-FEC padding factor of 3 |
| PE Disambiguity | Indicates PE disambiguity | Set to 1 if the condition in Equation (27-118) is met; otherwise it is set to 0 |

The UL Spatial Reuse subfield of the Common Info field carries the values to be included in the Spatial Reuse fields in the HE-SIG-A field of the solicited HE TB PPDUs. The format of the UL Spatial Reuse subfield is shown in Figure 9-64c (UL Spatial Reuse subfield format), where each Spatial Reuse *n* subfield, 1 ≤ *n* ≤ 4, is set to the same value as its corresponding subfield in the HE-SIG-A field of the HE TB PPDU, which are defined in Table 27-21 (HE-SIG-A field of an HE TB PPDU).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0                 B3 | B4                 B7 | B8               B11 | B12             B15 |
|  | Spatial Reuse 1 | Spatial Reuse 2 | Spatial Reuse 3 | Spatial Reuse 4 |
| Bits: | 4 | 4 | 4 | 4 |
| **Figure 9-64c-UL Spatial Reuse subfield format** |

The Doppler subfield of the Common Info field is set to 1 to indicate that a midamble is present in the HE TB PPDU and set to 0 otherwise.

The Doppler subfield of the Common Info field is reserved in a trigger soliciting an EHT TB PPDU.

The UL HE-SIG-A2 Reserved subfield of the Common Info field carries the value to be included in the Reserved field in the HE-SIG-A2 subfield of the solicited HE TB PPDUs. An HE AP sets the UL HE-SIG-A2 Reserved subfield to all 1s unless the AP is an EHT AP in which case the AP sets HE/EHT P160 subfield of the Common Info field to 0 to indicate to an EHT STA that the solicited TB PPDU in the primary 160 MHz is an EHT TB PPDU and sets HE/EHT P160 subfield of the Common Info field to 1 to indicate that the solicited TB PPDU is an HE TB PPDU.*(#M19, #M4)*

The Trigger Dependent Common Info subfield in the Common Info field is optionally present based on the value of the Trigger Type field (see 9.3.1.22.2 (Basic Trigger frame format) to 9.3.1.22.9 (NFRP Trigger frame format)).

***Discussion: Adding new subclause headers to simplify readability and searching for main blocks of the Trigger frame:***

***TGbe editor: Please a new subclause header in this location as follows:***

### 9.3.1.22.1.2 User Info List field*(#Ed)*

The User Info List field contains zero or more User Info fields.

***Discussion: Change below addresses #M1 which specifies that the size of all User Info fields within a Trigger frame is the same unless the trigger frame is an MU BAR Trigger.***

***TGbe editor: Please add a new paragraph in this location as follows:***

All User Info fields in the User Info field of a Trigger frame have the same length unless the Trigger frame is an MU BAR Trigger frame (see 9.3.1.22.4 (MU-BAR Trigger frame format) and 9.3.1.22.1.3 (Special User Info field)).*(#M1)*

***Discussion: Change below addresses #M21 which specifies that if a Special User Info field is not present in the Trigger frame then the User Info field is the HE format (namely HE variant here) and consequently if the Special User Info field is present and the User Info field is addressed to an EHT STA then the User info field is EHT variant.***

***TGbe editor: Please add a new paragraph in this location as follows:***

A User Info field that is addressed to a non-AP STA is either an HE variant or EHT variant. The User Info field is an EHT variant if it is addressed to an EHT non-AP STA and a Special User Info field is present in the Trigger frame (see 9.3.1.22.1.3 (Special User Info field); otherwise it is an HE variant.*(#M21)*

***TGbe editor: Please add a new subclause title. The subclause captures changes to existing HE spec text as follows***

### 9.3.1.22.1.2.1 HE variant User Info field*(#Ed)*

The HE variant User Info field is defined in Figure 9-64d (HE variant User Info field format) for all Trigger frame variants except the NFRP Trigger frame, which is defined in 9.3.1.22.9 (NFRP Trigger frame format).*(#M21)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0   B11 | B12    B19 | B20 | B21  B24 | B25 | B26            B31 | B32     B38 | B39 |  |
|  | AID12 | RUAllocation | UL FEC Coding Type | UL HE-MCS | UL DCM | SS Allocation/RA-RU Information | UL Target Receive Power | Reserved | Trigger Dependent User Info |
| Bits: | 12 | 8 | 1 | 4 | 1 | 6 | 7 | 1 | variable |
| **Figure 9-64d-HE variant User Info field format***(#M21)*The AID12 subfield in the User Info field is encoded as defined in Table 9-31h (AID12 subfield encoding):

|  |
| --- |
| **Table 9-31h-AID12 subfield encoding** |
| **AID12 subfield** | **Description** |
| 0 | User Info field allocates one or more contiguous RA-RUs for associated STAs |
| 1–2007 | User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield |
| 2008–2044 | Reserved |
| 2045 | User Info field allocates one or more contiguous RA-RUs for unassociated STAs |
| 2046 | Unallocated RU |
| 2047–4094 | Reserved |
| 4095 | Start of Padding field |

If the AID12 subfield is 2046, then the remaining subfields in the HE variant User Info field are reserved.If the AID12 subfield is 4095, then the remaining subfields in the HE variant User Info field are not present.

|  |
| --- |
| The RU Allocation subfield in an HE variant User Info field along with the UL BW subfield in the Common Info field identifies the size and the location of the RU. If the UL BW subfield indicates 20 MHz, 40 MHz or 80 MHz PPDU, then B0 of the RU Allocation subfield is set to 0. If the UL BW subfield indicates 80+80 MHz or 160 MHz, then B0 of the RU Allocation subfield is set to 0 to indicate that the RU allocation applies to the primary 80 MHz channel and set to 1 to indicate that the RU allocation applies to the secondary 80 MHz channel. The mapping of B7–B1 of the RU Allocation subfield for an HE variant User Info field in a Trigger frame that is not an MU-RTS Trigger frame is defined in Table 9-31i (B7–B1 of the RU Allocation subfield). See 9.3.1.22.5 (MU-RTS Trigger frame format) for the encoding of the RU Allocation subfield in an MU-RTS Trigger frame.**Table 9-31i-B7–B1 of the RU Allocation subfield in an HE variant User Info field** |
| **B7-B1 of the RU Allocation subfield** | **UL BW subfield** | **RU size** | **RU Index** |
| 0–8 | 20 MHz, 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | 26 | RU1 to RU9, respectively |
| 9–17 | 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | RU10 to RU18, respectively |
| 18–36 | 80 MHz, 80+80 MHz or 160 MHz | RU19 to RU37, respectively |
| 37–40 | 20 MHz, 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | 52 | RU1 to RU4, respectively |
| 41–44 | 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | RU5 to RU8, respectively |
| 45–52 | 80 MHz, 80+80 MHz or 160 MHz | RU9 to RU16, respectively |
| 53, 54 | 20 MHz, 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | 106 | RU1 and RU2, respectively |
| 55, 56 | 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | RU3 and RU4, respectively |
| 57–60 | 80 MHz, 80+80 MHz or 160 MHz | RU5 to RU8, respectively |
| 61 | 20 MHz, 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | 242 | RU1 |
| 62 | 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | RU2 |
| 63, 64 | 80 MHz, 80+80 MHz or 160 MHz | RU3 and RU4, respectively |
| 65 | 40 MHz, 80 MHz, 80+80 MHz or 160 MHz | 484 | RU1 |
| 66 | 80 MHz, 80+80 MHz or 160 MHz | RU2 |
| 67 | 80 MHz, 80+80 MHz or 160 MHz | 996 | RU1 |
| 68 | 80+80 MHz or 160 MHz | 2×996 | RU1 |
| NOTE—If the UL BW subfield indicates 80+80 MHz or 160 MHz, the description indicates the RU index for the primary 80 MHz channel or secondary 80 MHz channel as indicated by B0 of the RU Allocation subfield. |

 If the UL BW subfield indicates 20 MHz, the mapping of the RU index to RU is defined in Table 27-7 (Data and pilot subcarrier indices for RUs in a 20 MHz HE PPDU and in a non-OFDMA 20 MHz HE PPDU) in increasing order.If the UL BW subfield indicates 40 MHz, the mapping of the RU index to RU is defined in Table 27-8 (Data and pilot subcarrier indices for RUs in a 40 MHz HE PPDU and in a non-OFDMA 40 MHz HE PPDU) in increasing order.If the UL BW subfield indicates 80 MHz, 160 MHz or 80+80 MHz, the mapping of the RU index to RU is defined in Table 27-9 (Data and pilot subcarrier indices for RUs in an 80 MHz HE PPDU and in a non-OFDMA 80 MHz HE PPDU) in increasing order.If the UL BW subfield indicates 160 MHz or 80+80 MHz, B7–B1 of the RU Allocation subfield is set to 68 and B0 is set to 1 to indicate a 2×996-tone RU. A non-AP STA ignores B0 for 2×996-tone RU indication.If the AID12 subfield is in the range 1 to 2007, then the RU Allocation subfield indicates the RU allocated to the STA identified by the AID12 subfield. If the AID12 subfield is 0 or 2045, then the RU Allocation sub-field indicates the starting RU of one or more contiguous RA-RUs allocated by the HE variant User Info field. If the AID12 subfield is 2046, then the RU Allocation subfield indicates an unallocated RU.If there is more than one RA-RU (i.e., the Number Of RA-RU subfield of this HE variant User Info field has a value greater than 0), then the allocated RUs are contiguous and the RU sizes of all RA-RUs are the same and equal to the size of the first RU. Further, all the remaining subfields of the HE variant User Info field apply to all the RA-RUs.The UL FEC Coding Type subfield of the User Info field indicates the code type of the solicited PPDU. The UL FEC Coding Type subfield is set to 0 to indicate BCC and set to 1 to indicate LDPC.The UL HE-MCS subfield of the HE variant User Info field indicates the HE-MCS of the solicited HE TB PPDU. The encoding of the UL HE-MCS subfield is defined in 27.3.7 (HE modulation and coding schemes (HE-MCSs)). The UL DCM subfield of the HE variant User Info field indicates DCM of the solicited HE TB PPDU. The UL DCM subfield is set to 1 to indicate that DCM is used in the solicited HE TB PPDU as defined in 27.3.12.15 (Dual carrier modulation). The UL DCM subfield is set to 0 to indicate that DCM is not used. The UL DCM subfield is set to 0 if the UL STBC subfield of the Common Info field is set to 1.If the AID12 subfield is either 0 or 2045, then B26–B31 of the User Info field is the RA-RU Information subfield, otherwise B26–B31 of the User Info field is the SS Allocation subfield.The SS Allocation subfield of the HE variant User Info field indicates the spatial streams of the solicited HE TB PPDU and the format is defined in Figure 9-64e (SS Allocation subfield format of an HE variant User Info field).

|  |  |  |
| --- | --- | --- |
|  | B26 B28 | B29 B31 |
|  | Starting Spatial Stream | Number Of Spatial Streams |
| Bits: | 3 | 3 |
| **Figure 9-64e--SS Allocation subfield format of an HE variant User Info field** |

The Starting Spatial Stream subfield indicates the starting spatial stream and is set to the starting spatial stream minus 1.The Number of Spatial Streams subfield indicates the number of spatial streams, and is set to the number of spatial streams minus 1.The RA-RU Information subfield of the User Info field indicates the RA-RU information and the format is defined in Figure 9-64f (RA-RU Information subfield format).

|  |  |  |
| --- | --- | --- |
|  | B26 B30 | B31 |
|  | Number Of RA-RU | More RA-RU |
| Bits: | 5 | 1 |
| **Figure 9-64f-RA-RU Information subfield format** |

The Number Of RA-RU subfield indicates the number of contiguous RUs allocated for UORA. The value of the Number Of RA-RU subfield is equal to the number of contiguous RA-RUs minus 1.NOTE—The starting spatial stream and the number of spatial streams of the HE TB PPDU transmitted on each RA-RU are 1.The More RA-RU subfield is set to 1 to indicate that RA-RUs of the type indicated by the AID12 subfield in this User Info field (see Table 9-31h (AID12 subfield encoding)) are allocated in subsequent Trigger frames that are sent until the end of the TWT SP in which the Trigger frame carrying this field is sent. Otherwise, the subfield is set to 0. The More RA-RU subfield is reserved if the More TF field in the Common Info field is set to 0.The UL Target Receive Power subfield indicates the expected receive signal power, measured at the AP's antenna connector and averaged over the antennas, for the HE portion of the HE TB PPDU transmitted on the assigned RU and is defined in Table 9-31j (UL Target Receive Power subfield in Trigger frame).

|  |
| --- |
| **Table 9-31j-UL Target Receive Power subfield in Trigger frame** |
| **UL Target Receive Power subfield** | **Description** |
| 0–90 | The expected receive signal power, in units of dBm, is *Targetpwr* = –110 + *Fval*, where *Fval* is the subfield value |
| 91–126 | Reserved |
| 127 | The STA transmits the TB PPDU at the STA’s maximum transmit power for the assigned MCS.NOTE—The expected receive signal power is then the STA's maximum transmit power for the assigned MCS minus the path loss. |

The Trigger Dependent User Info subfield in the User Info field is optionally present based on the value of the Trigger Type field (see 9.3.1.22.2 (Basic Trigger frame format) to 9.3.1.22.9 (NFRP Trigger frame format)). |

***TGbe editor: Please add a new subclause that captures changes specific for the EHT variant User Info field as follows:***

### 9.3.1.22.1.2.2 EHT variant User Info field*(#Ed)*

***Discussion: Changes below address several motions:***

* ***#M25: Which specifies that B39 in the User Info field addressed to an EHT STA is the PS160 subfield, which along with the RU Allocation subfield, specifies the RU/MRU.***
* ***#M24: B25 in the User Info field addressed to an EHT STA is reserved and set to 1 in R1.***

***Discussion: Addresses #M22, which species that Special User Info field is IDed by AID 2007.***The EHT variant User Info field is defined in Figure 9-64d1-EHT variant User Info field format for all Trigger frame variants except the NFRP Trigger frame.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0   B11 | B12    B19 | B20 | B21  B24 | B25 | B26            B31 | B32     B38 | B39 |  |
|  | AID12 | RUAllocation | UL FEC Coding Type | UL EHT-MCS | Reserved | SS Allocation/RA-RU Information | UL Target Receive Power | PS160 | Trigger Dependent User Info |
| Bits: | 12 | 8 | 1 | 4 | 1 | 6 | 7 | 1 | variable |
| **Figure 9-64d1--****EHT variant User Info field format** *(#M24, #M25)* |

If the AID12 subfield is 2007 and the Trigger frame containing this User Info field is generated by an EHT AP, then the remaining fields of the User Info field are defined in 9.3.1.22.1.3 (Special User Info field).*(#M22, #M20)* Otherwise, the AID12 subfield in the EHT variant User Info field is encoded as defined in Table 9-31h (AID12 subfield encoding)

***Discussion: Addresses several motions that provide the RU allocation mapping for an EHT RU allocation (#M8 to #M17, and #M25).***

The RU Allocation subfield in an EHT variant User Info field in a Trigger frame that is not an MU-RTS Trigger frame along with the UL BW subfield in the Common Info field, the UL BW Extension subfield in the Special User Info field, and the PS160 subfield in the EHT variant User Info field, identifies the size and the location of the RU/MRU. The mapping of B7–B1 of the RU Allocation subfield along with the settings of B0 of the RU Allocation subfield and PS160 subfield in the EHT variant User Info field are defined in **Table 9-31i1** ( Encoding of PS160 and RU allocation subfields in an EHT variant User Info field), where the bandwidth is obtained from the combination of the UL BW subfield and UL BW Extension subfields as defined in Table 9-31k (UL BW Extension encoding) and *N* is obtained from Equation (9-0c) and Table 9-31i2 (Logical to Physical Conversion of Parameters to obtain PHY RU/MRU index).

|  |
| --- |
| **Table 9-31i1- Encoding of PS160 and RU allocation subfield in an EHT variant User Info field** |
| **PS160 subfield** | **B0 of RU Allocation subfield** | **B7-B1 of RU Allocation subfield** | **Bandwidth** | **RU/MRU size** | **RU/MRU index** | **PHY RU/MRU index** |
| 0-3: 80 MHz segment where the RU is located | 0–8 | 20, 40, 80, 160, or 320 MHz | 26 | RU1 to RU9, respectively | 37×N + RU index |
| 9–17 | 40, 80, 160, or 320 MHz | RU10 to RU18, respectively |
| 18 | 80, 160, or 320 MHz | Reserved |
| 19–36 | 80, 160, or 320 MHz | RU20 to RU37, respectively |
| 37–40 | 20, 40, 80, 160, or 320 MHz | 52 | RU1 to RU4, respectively | 16×N + RU index |
| 41–44 | 40, 80, 160, or 320 MHz | RU5 to RU8, respectively |
| 45–52 | 80, 160, or 320 MHz | RU9 to RU16, respectively |
| 53, 54 | 20, 40, 80, 160, or 320 MHz | 106 | RU1 and RU2, respectively | 8×N + RU index |
| 55, 56 | 40, 80, 160, or 320 MHz | RU3 and RU4, respectively |
| 57–60 | 80, 160, or 320 MHz | RU5 to RU8, respectively |
| 61 | 20, 40, 80, 160, or 320 MHz | 242 | RU1 | 4×N + RU index |
| 62 | 40, 80, 160, or 320 MHz | RU2 |
| 63, 64 | 80, 160, or 320 MHz | RU3 and RU4, respectively |
| 65 | 40, 80, 160, or 320 MHz | 484 | RU1 | 2×N + RU index |
| 66 | 80, 160, or 320 MHz | RU2 |
| 67 | 80, 160, or 320 MHz | 996 | RU1 | N + RU index |
| 0-1: 160 MHz segment where RU is located | 0 | 68 | Reserved | Reserved |
| 1 | 160, or 320 MHz | 2×996 | RU1 | X1 + RU index |
| 0 | 0 | 69 | Reserved | Reserved |
| 0 | 1 |
| 1 | 0 |
| 1 | 1 | 320 MHz | 4×996 | RU1 | RU1 |
| 0–3:80 MHz segment where the MRU is located | 70–72 | 20, 40, 80, 160, or 320 MHz | 52+26 | MRU1 to MRU3, respectively | 12×N + MRU index  |
| 73–75 | 40, 80, 160, or 320 MHz | 52+26 | MRU4 to MRU6, respectively |
| 76–81 | 80, 160, or 320 MHz | 52+26 | MRU7 to MRU12, respectively |
| 82–83 | 20, 40, 80, 160, or 320 MHz | 106+26 | MRU1 to MRU2, respectively | 8×N + MRU index |
| 84–85 | 40, 80, 160, or 320 MHz | 106+26 | MRU3 to MRU4, respectively |
| 86–89 | 80, 160, or 320 MHz | 106+26 | MRU5 to MRU8, respectively |
| 90–93 | 80, 160, or 320 MHz | 484+242 | MRU1 to MRU4, respectively | 4×N + MRU index |
| 0-1: 160 MHz segment where MRU is located*(#M10)* | 0 | 94–95 | 160, or 320 MHz | 996+484 | MRU1 to MRU2, respectively | 4×X1 + MRU index |
| 1 | MRU3 to MRU4, respectively |
| 0-1: 160 MHz segment where MRU is located*(#M11)* | 0 | 96-99 | 160, or 320 MHz | 996+484+242 | MRU1 to MRU4, respectively | 8×X1 + MRU index |
| 1 | MRU5 to MRU8, respectively |
| 0 | 0 | 100-103*(#M12)* | 320 MHz | 2x996+484 | MRU1 to MRU4, respectively | MRU index |
| 0 | 1 | MRU5 to MRU6, respectively |
| 1 | 0 | MRU7 to MRU8, respectively |
| 1 | 1 | MRU9 to MRU12, respectively |
| 0 | 0 | 104 | 320 MHz | 3x996 | MRU1 | MRU index |
| 0 | 1 | MRU2 |
| 1 | 0 | MRU3 |
| 1 | 1 | MRU4 |
| 0 | 0 | 105-106 | 320 MHz | 3x996+484 | MRU1 to MRU2, respectively | MRU index |
| 0 | 1 | MRU3 to MRU4, respectively |
| 1 | 0 | MRU5 to MRU6, respectively |
| 1 | 1 | MRU7 to MRU8, respectively |
| Any | Any | 107-127 | Any | Reserved | Reserved | Reserved |
| NOTE 1--B0 of the RU Allocation subfield is set to 0 to indicate that the RU/MRU allocation applies to the primary 80 MHz channel and set to 1 to indicate that the RU allocation applies to the secondary 80 MHz channel in the primary 160 MHz. B0 of the RU Allocation subfield is set to 0 to indicate that the RU/MRU allocation applies to the lower 80 MHz in the secondary 160 MHz and is set to 1 to indicate that the RU allocation applies to upper 80 MHz in the secondary 160 MHz.*(#M5, #M8, #M9, #M10, #M11, #M12, #M13, #M14, #M15, #M16)* |

***Discussion: Proposed changes below address #M17 , which defines how to calculate N in the RU allocation table.***

The parameter 𝑁 in the Trigger Frame RU Allocation table is calculated using Equation (9-0c).

* *N* = 2×X1+X0 (9-0c)

Table 9-31i2 (Logical to Physical Conversion of Parameters to obtain PHY RU/MRU index for 320MHz bandwidth) summarizes how to use Equation (9-0c) to calculate N for different configurations. For a bandwidth less than or equal to 80MHz, PS160, B0, X0 and X1 are set to 0. For a bandwidth of 160MHz, PS160 and X1 are set to 0, and X0 is specified in the table. For a bandwidth of 320MHz, PS160, X0, X1 are specified in the table. The configuration indicates the absolute frequency order of the primary and secondary 80 MHz and 160 MHz channels. The order from left to right indicates the order from lower frequency to higher frequency. The primary 80 MHz channel is indicated by P80, the secondary 80 MHz channel is indicated by S80, and the secondary 160 MHz channel is indicated by S160.

**Table 9-31i2- Logical to Physical Conversion of Parameters to obtain PHY RU/MRU index**

|  |  |  |
| --- | --- | --- |
| **Bandwidth** | **Logical Inputs** | **Physical Outputs** |
| **Configuration** | **PS160** | **B0** | **X0** | **X1** | **N** |
| 20/40/80 MHz | P80 | 0 | 0 | 0 | 0 | 0 |
| 160 MHz | [P80 S80] | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| [S80 P80] | 0 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 320 MHz | [P80 S80 S160] | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 2 |
| 1 | 1 | 1 | 1 | 3 |
| [S80 P80 S160] | 0 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 2 |
| 1 | 1 | 1 | 1 | 3 |
| [S160 P80 S80] | 0 | 0 | 0 | 1 | 2 |
| 0 | 1 | 1 | 1 | 3 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 1 |
| [S160 S80 P80] | 0 | 0 | 1 | 1 | 3 |
| 0 | 1 | 0 | 1 | 2 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 1 |

*(#M17)*

For 26-tone RU, 52-tone RU, 106-tone RU, 242-tone RU, 484-tone RU, 996-tone RU, 52+26-tone MRU, and 106+26-tone MRU, the description of RU/MRU index indicates the RU/MRU index for the 80 MHz channel as indicated by PS160 subfield and B0 of RU Allocation subfield.

For 2×996-tone RU, 996+484-tone MRU, and 996+484+242-tone MRU, the description of RU/MRU index indicates the RU/MRU index for the 160 MHz channel as indicated by PS160 subfield.

For 4×996-tone RU, 2x996+484-tone MRU, 3×996-tone MRU, and 3×996+484-tone MRU, the description of RU/MRU index indicates the RU/MRU index for the 320 MHz channel.

If the Bandwidth indicates 20 MHz, the mapping of the PHY RU index to RU is defined in Table 27-7 (Data and pilot subcarrier indices for RUs in a 20 MHz HE PPDU and in a non-OFDMA 20 MHz HE PPDU) in increasing order.

If the Bandwidth indicates 40 MHz, the mapping of the PHY RU index to RU is defined in Table 27-8 (Data and pilot subcarrier indices for RUs in a 40 MHz HE PPDU and in a non-OFDMA 40 MHz HE PPDU) in increasing order.

If the Bandwidth indicates 80 MHz, the mapping of the PHY RU index to RU is defined in Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 160 MHz, the mapping of the PHY RU index to RU is defined in Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 320 MHz, the mapping of the PHY RU index to RU is defined in Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 20 MHz, the mapping of the PHY MRU index to MRU is defined in Table 36-X1 (Indices for small size MRUs in an OFDMA 20 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 40 MHz, the mapping of the PHY MRU index to MRU is defined in Table 36-X2 (Indices for small size MRUs in an OFDMA 40 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 80 MHz, the mapping of the PHY MRU index to MRU is defined in Table 36-X3 (Indices for small size MRUs in an OFDMA 80 MHz EHT PPDU) and Table 36-X6 (Indices for large size MRUs in an 80 MHz EHT PPDU and in a non-OFDMA 80 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 160 MHz, the mapping of the PHY MRU index to MRU is defined in Table 36-X4 (Indices for small size MRUs in an OFDMA 160 MHz EHT PPDU) and Table 36-X7 (Indices for large size MRUs in an 160 MHz EHT PPDU and in a non-OFDMA 160 MHz EHT PPDU) in increasing order.

If the Bandwidth indicates 320 MHz, the mapping of the PHY MRU index to MRU is defined in Table 36-X5 (Indices for small size MRUs in an OFDMA 320 MHz EHT PPDU) and Table 36-X8 (Indices for large size MRUs in an 320 MHz EHT PPDU and in a non-OFDMA 320 MHz EHT PPDU) in increasing order.

The UL FEC Coding Type subfield of the User Info field indicates the code type of the solicited EHT TB PPDU. The UL FEC Coding Type subfield is set to 0 to indicate BCC and set to 1 to indicate LDPC.

The UL EHT-MCS subfield of the User Info field indicates the EHT-MCS of the solicited EHT TB PPDU. In an EHT variant User Info field, the encoding of the UL EHT-MCS subfield is defined in 36.3.7 (EHT modulation and coding schemes (EHT-MCSs)).

***Discussion: Proposed changes below address #M24 , according to which DCM bit is reserved in a User Info field addressed to an EHT STA (for R1).***

B25 is reserved in the EHT variant User Info field.*(#M24)*

***Discussion: Proposed changes below address #M26 , according to which the User Info field addressed to an EHT STA has an Spatial Stream allocation field that contains 4 bits for starting spatial stream and 2 bits for number of spatial streams.***

The SS Allocation subfield of the EHT variant User Info field indicates the spatial streams of the solicited EHT TB PPDU and the format is defined in Figure 9-64e1 (SS Allocation subfield format of an EHT variant User Info field). *(#M26)*

|  |  |  |
| --- | --- | --- |
|  | B26 B29 | B30 B31 |
|  | Starting Spatial Stream | Number of Spatial Streams |
| Bits: | 4 | 2 |
| **Figure 9-64e1--SS Allocation subfield format of an EHT variant User Info field***(#M26)* |

***Discussion: Proposed changes below address #M25 , according to which B39 of the EHT variant User Info field indicates the primary/secondary 160 MHz subfield.***

If the size of RU/MRU is smaller than or equal to 2×996-tone, then PS160 subfield is set to 0 to indicate that RU/MRU allocation applies to the primary 160 MHz channel and set to 1 to indicate that RU/MRU allocation applies to the secondary 160 MHz channel. Otherwise, it is used to indicate the RU/MRU index along with the RU Allocation subfield. The PS160 subfield is set as defined in Table 9-31i (Encoding of PS160 and RU allocation subfields in an EHT variant User Info field).(#M8, #M25)

The RA-RU Information, UL Target Receive Power, and Trigger Dependent User Info subfields are set as defined in 9.3.1.22.1.2.1 (HE variant User Info field).

***Discussion: Proposed changes below address the following motions:***

* ***#M1, which specifies that all Per User Info fields in a Trigger frame other than MU BAR Trigger frame shall have the same size. For this purpose the resolution specifies the lengths of the Triger Dependent User Info fields for each variant that contains these fields, and that the subfields are reserved, except for the MU BAR Trigger variants for which the BAR Type is set to specific values for their corresponding variants (since HE STAs use this information to determine the length of the user info field).***
* ***#M18, which provides a table for the UL BW Extension subfield. Note that all values are copy pasted from motion.***
* ***#M20, which defines the format of the Special User Info field, its location (being after the Common Info field) and that the length of this Special User Info field is the same as those of other User Info fields of the Trigger frame variant. Please note that the U-SIG Reserved bits are set to all 1s in this resolution, which is inline with the setting of the UL HE-SIG-A2 of the solicited HE TB PPDU.***
* ***#M21, which specifies that if a Special User Info field is not present then the User Info field is an HE variant and the EHT STA transmits an HE TB PPDU, otherwise the User Info field is an EHT variant and the STA transmits an EHT TB PPDU.***
* ***#M22, which species that Special User Info field is IDed by AID 2007.***
* ***#M23, which specifies that there are two SR fields in the U-SIG of TB PPDU. Since these are not derived fields of U-SIG they need to be included in the Special User Info field (which carries the non-derived subfields of the U-SIG).***

***TGbe editor: Please insert a new subclause below as follows:***

### 9.3.1.22.1.3 Special User Info field *(#M20, M21, M3)*

If the Special User Info field is inlcuded in the Trigger frame then the Special User Info field present subfield of the EHT variant of the Common Info Field is set to 0, otherwise it is set to 1.

The Special User Info field is identified by an AID12 value of 2007 and is optionally present in a Trigger frame that is generated by an EHT AP.

NOTE—An EHT AP does not use the value 2007 as an AID for any STA associated to it (see 35.4.1 (UL MU operation).*(#M22)*

NOTE - The length of the Special User Info field is equal to the length of the other User Info fields present in the same Trigger frame, except when the Trigger frame is an MU-BAR Trigger frame, since the lengths of the User Info fields in the MU-BAR are not necessarily the same.*(#M1, #M20)*

The Special User Info field, if present, is located immediately after the Common Info field of the Trigger frame and carries the non-derived subfields of the U-SIG field of a solicited EHT TB PPDU, and the Special User Info Field Present subfield of the Common Info Field is set to 0. *(#M20)*

If HE/EHT P160 subfield of the Common Info field is set to 0 then a User Info field addressed to an EHT STA is an EHT variant User Info field. The addressed EHT STA responds to the Trigger frame with an EHT TB PPDU as defined in 35.4.1 (UL MU operation), except for an MU-RTS in which case the EHT STA responds to the Trigger frame with a non-HT duplicate PPDU. *(#M3, #M21)*

If HE/EHT P160 subfield of the Common Info field is se to 1 then a User Info field addressed to an EHT STA is an HE variant User Info field. The addressed EHT STA responds to the Trigger frame with an HE TB PPDU as defined in 26.5.2 (UL MU operation), except for an MU-RTS in which case the EHT STA responds to the Trigger frame with a non-HT duplicate PPDU  *(#M3, #M21)*

The format of the Special User Info field is defined in the Figure 9-64e2.*(#M20)*

**Figure 9-64e 2— Special User Info field format**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B11 | B12   B14 | B15          B16 | B17 B20 | B21   B24 | B25 B36 | B37 B39 |  |
|  | AID12 | PHY Version ID | UL Bandwidth Extension | Spatial Reuse 1 | Spatial Reuse 2 | U-SIG Disregard And Validate | Reserved | Trigger Dependent User Info |
| Bits: | 12 | 3 | 2 | 4 | 4 | 12 | 3 | variable |
|  |

The PHY Version ID subfield indicates the PHY version. The PHY Version ID subfield is set to 0 for EHT.*(#M20)*

The UL BW Extension subfield, together with the UL BW subfield in the Common Info field, indicates the bandwidth of the solicited TB PPDU from the addressed EHT STA (i.e., the bandwidth in the U-SIG of the EHT TB PPDU). The UL BW Extension subfield is defined in Table 9-31k (UL BW Extension encoding).*(#M20)*

|  |
| --- |
| * **UL BW Extension subfield encoding**
 |
| **UL BW** | **Bandwidth for HE TB PPDU (MHz)** | **UL BW Extension** | **Bandwidth for EHT TB PPDU (MHz)** |
| 0 | 20 | 0 | 20 |
| 0 | 20 | 1 | Reserved |
| 0 | 20 | 2 | Reserved |
| 0 | 20 | 3 | Reserved |
| 1 | 40 | 0 | 40 |
| 1 | 40 | 1 | Reserved |
| 1 | 40 | 2 | Reserved |
| 1 | 40 | 3 | Reserved |
| 2 | 80 | 0 | 80 |
| 2 | 80 | 1 | Reserved |
| 2 | 80 | 2 | Reserved |
| 2 | 80 | 3 | Reserved |
| 3 | 160 | 0 | Reserved |
| 3 | 160 | 1 | 160 |
| 3 | 160 | 2 | 320-1 |
| 3 | 160 | 3 | 320-2 |

*(#M18)*

The Spatial Reuse *n* subfield, 1 <= *n* <= 2, is set to the same value as its corresponding subfield in the U-SIG of the EHT TB PPDU, which are defined in Table 36-22 (U-SIG field of an EHT TB PPDU).  *(#M20, M23)*

The U-SIG Disregard and Validate subfield carries the value to be included in the Disregard and Validate subfield of the U-SIG field of the solicited EHT TB PPDUs.TheMapping from the U-SIG Disregard and Validate subfield to bits in the U-SIG field for a TB PPDU is defined in Table 9-31l (Mapping from U-SIG Disregard and Validate subfield to bits in the U-SIG field for a TB PPDU). *(#M20)*

|  |
| --- |
| **Table 9-31l-Mapping from Special User Info field to U-SIG-1 and U-SIG-2 fields in the TB PPDU** |
| **Bits in Special User Info field** | **Action at Receiving STA** |
| B25-B30 | Copy to B20-B25 of the U-SIG-1 field (Disregard subfield) |
| B31 | Copy to B2 of the U-SIG-2 field (Validate subfield) |
| B32-B36 | Copy to B11-B15 of the U-SIG-2 field (Disregard subfield) |

The presence and length of the Trigger Dependent User Info subfield in the Special User Info field depends on the variant of the Trigger frame. When present, the length and the subfields of the Trigger Dependent User Info subfield are as follows:

* The length is one octet and all the subfields are reserved in a Basic Trigger frame and in a BFRP Trigger frame,
* The length is 4 octets and all the subfields, except for the BAR Type subfield, are reserved in an MU-BAR Trigger frame and a GCR MU-BAR Trigger frame. The BAR Type subfield is set to indicate a Compressed BAR in an MU BAR Trigger frame and is set to indicate a GCR BAR in a GCR MU BAR Trigger frame.*(#M1, #M20)*

### 9.3.1.22.1.4 Padding field

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, if present, is at least two octets in length and is set to all 1s. If the Padding field is present in a Trigger frame, its length is computed as described in 26.5.2.2.3 (Padding for Trigger frame or frame containing TRS Control subfield).

### 9.3.1.22.2 Basic Trigger frame format

The Trigger Dependent Common Info subfield is not present in the Basic Trigger frame. The Trigger Dependent User Info subfield of the Basic Trigger frame is defined in Figure 9-64g (Trigger Dependent User Info subfield format in the Basic Trigger frame).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0                       B1 | B2                    B4 | B5 | B6               B7 |
|  | MPDU MU Spacing Factor | TID Aggregation Limit | Reserved | Preferred AC |
| Bits: | 2 | 3 | 1 | 2 |
| * **Trigger Dependent User Info subfield format in the Basic Trigger frame**
 |

The MPDU MU Spacing Factor subfield is used for calculating the value by which the minimum MPDU start spacing is multiplied (see 10.12.3 (Minimum MPDU Sstart Sspacing field rules)).

The TID Aggregation Limit subfield indicates the MPDUs allowed in an A-MPDU carried in the HE TB PPDU and the maximum number of TIDs that can be aggregated by the STA in the A-MPDU and is set as defined in 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield).

The value in the TID Aggregation Limit subfield in Trigger frame is less than or equal to *MT* + 1, where *MT* is the value indicated in the Multi-TID Aggregation Tx Support subfield in the HE MAC Capabilities Information field in the HE Capabilities element transmitted by the non-AP STA that is the intended receiver of the User Info field.

The Preferred AC subfield indicates the lowest AC that is recommended for aggregation of MPDUs in the A-MPDU contained in the HE TB PPDU sent as a response to the Trigger frame. The encoding of the Preferred AC subfield is as defined in Table 9-154 (ACI-to-AC encoding).

### 9.3.1.22.3 BFRP Trigger frame format

The Trigger Dependent Common Info subfield is not present in the BFRP Trigger frame. The Trigger Dependent User Info subfield of the BFRP Trigger frame is defined in Figure 9-64h (Trigger Dependent User Info subfield format in the BFRP Trigger frame).

|  |  |
| --- | --- |
|  |  |
|  | Feedback SegmentRetransmission Bitmap |
| Octets: | 1 |
| * **Trigger Dependent User Info subfield format in the BFRP Trigger frame**
 |

The Feedback Segment Retransmission Bitmap subfield indicates the requested feedback segments of an HE compressed beamforming report. If the bit in position *n* (*n*= 0 for LSB and *n*= 7 for MSB) is 1, then the feedback segment with the Remaining Feedback Segments subfield in the HE MIMO Control field equal to *n* is requested. If the bit in position *n* is 0, then the feedback segment with the Remaining Feedback Segments subfield in the HE MIMO Control field equal to *n* is not requested.

### 9.3.1.22.4 MU-BAR Trigger frame format

The Trigger Dependent Common Info subfield is not present in the MU-BAR Trigger frame. The Trigger Dependent User Info subfield for the MU-BAR Trigger frame is defined in Figure 9-64i (Trigger Dependent User Info subfield format in the MU-BAR Trigger frame).

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | BAR Control | BAR Information |
| Octets: | 2 | variable |
| * **Trigger Dependent User Info subfield format in the MU-BAR Trigger frame**
 |

The BAR Control subfield is defined in 9.3.1.7 (BlockAckReq frame format) and indicates either a Compressed BlockAckReq variant or a Multi-TID BlockAckReq variant.

The BAR Information subfield is defined in 9.3.1.7 (BlockAckReq frame format).

### 9.3.1.22.5 MU-RTS Trigger frame format

The Trigger Dependent Common Info subfield and Trigger Dependent User Info subfield are not present in the MU-RTS Trigger frame.

The UL BW subfield in the Common Info field indicates the bandwidth of the PPDU carrying the MU-RTS Trigger frame and is defined in Table 9-31d (UL BW subfield encoding).

The UL Length, GI And HE-LTF Type, MU-MIMO HE-LTF Mode, Number Of HE-LTF Symbols And Midamble Periodicity, UL STBC, LDPC Extra Symbol Segment, AP Tx Power, Pre-FEC Padding Factor, PE Disambiguity, UL Spatial Reuse, Doppler and UL HE-SIG-A2 Reserved subfields in the Common Info field are reserved.

The UL HE-MCS, UL FEC Coding Type, UL DCM, SS Allocation/RA-RU Information and UL Target Receive Power fields in the User Info field are reserved.

The RU Allocation subfield in the User Info field addressed to the STA indicates whether the CTS frame is transmitted on the primary 20 MHz channel, primary 40 MHz channel, primary 80 MHz channel, 160 MHz channel, or 80+80 MHz channel.

B0 of the RU Allocation subfield is set to 0 to indicate primary 20 MHz channel, primary 40 MHz channel and primary 80 MHz channel. For 160 MHz and 80+80 MHz indication, B0 of the RU Allocation subfield is set to 1. A non-AP STA ignores B0 for 160 MHz and 80+80 MHz indication.

B7–B1 of the RU Allocation subfield is set to indicate the primary 20 MHz channel as follows:

* 61 if the primary 20 MHz channel is the only 20 MHz channel or the lowest frequency 20 MHz channel in the primary 40 MHz channel or primary 80 MHz channel
* 62 if the primary 20 MHz channel is the second lowest frequency 20 MHz channel in the primary 40 MHz channel or primary 80 MHz channel
* 63 if the primary 20 MHz channel is the third lowest frequency 20 MHz channel in the primary 80 MHz channel
* 64 if the primary 20 MHz channel is the fourth lowest frequency 20 MHz channel in the primary 80 MHz channel

B7–B1 of the RU Allocation subfield is set to indicate the primary 40 MHz channel as follows:

* 65 if the primary 40 MHz channel is the only 40 MHz channel or the lowest frequency 40 MHz channel in the primary 80 MHz channel
* 66 if the primary 40 MHz channel is the second lowest frequency 40 MHz channel in the primary 80 MHz channel

B7–B1 of the RU Allocation subfield is set to 67 to indicate the primary 80 MHz channel.

B7–B1 of the RU Allocation subfield is set to 68 to indicate the primary and secondary 80 MHz channel.

The settings for B7–B1 of the RU Allocation subfield are illustrated in Figure 9-64j (UL BW subfield and B7–B1 of RU Allocation subfield in MU-RTS Trigger frame).

|  |
| --- |
|  |
| * **Figure 9-64j—UL BW subfield and B7–B1 of RU Allocation subfield in MU-RTS Trigger frame**
 |

### 9.3.1.22.6 BSRP Trigger frame format

The Trigger Dependent Common Info subfield and Trigger Dependent User Info subfield are not present in the BSRP Trigger frame.

### 9.3.1.22.7 GCR MU-BAR Trigger frame format

The Trigger Dependent Common Info subfield of the GCR MU-BAR Trigger frame is defined in Figure 9-64k (Trigger Dependent Common Info subfield format in the GCR MU-BAR Trigger frame). The Trigger Dependent User Info subfield is not present in the GCR MU-BAR Trigger frame.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | BAR Control | BAR Information |
| Octets: | 2 | 2 |
| **Figure 9-64k-Trigger Dependent Common Info subfield format in the GCR MU-BAR Trigger frame** |

The BAR Control subfield is defined in 9.3.1.7 (BlockAckReq frame format) and indicates a GCR BlockAckReq variant.

The BAR Information subfield is defined in 9.3.1.7.6 (GCR BlockAckReq variant) except that the GCR Group Address field is not present.

NOTE—A GCR MU-BAR Trigger frame is not a type of MU BAR Trigger frame.

### 9.3.1.22.8 BQRP Trigger frame format

The Trigger Dependent Common Info subfield and Trigger Dependent User Info subfield are not present in the BQRP Trigger frame.

### 9.3.1.22.9 NFRP Trigger frame format

The UL BW subfield in the Common Info field indicates the bandwidth of the NDP feedback report response.

The UL STBC, LDPC Extra Symbol Segment, Pre-FEC Padding Factor, PE Disambiguity, UL Spatial Reuse, and Doppler subfields in the Common Info field are reserved.

The Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field indicates the number of HE-LTF symbols present in the NDP feedback report response and is set to 1.

The GI And HE-LTF Type subfield in the Common Info field is set to 2.

The Trigger Dependent Common Info subfield is not present.

The User Info field for NFRP Trigger frame is defined in Figure 9-64l (User Info field format in the NFRP Trigger frame).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  | Starting AID | Reserved | Feedback Type | Reserved | UL Target Receive Power | Multiplexing Flag |
| Bits: | 12 | 9 | 4 | 7 | 7 | 1 |
| * **User Info field format in the NFRP Trigger frame**
 |

The Feedback Type subfield encoding is defined in Table 9-31k (Feedback Type subfield encoding).

|  |
| --- |
| * **Feedback Type subfield encoding**
 |
| **Value** | **Description** |
| 0 | Resource request |
| 1-15 | Reserved |

The scheduled non-AP HE STAs are identified by a range of AIDs. The Starting AID field defines the first AID of the range of AIDs that are scheduled to respond to the NFRP Trigger frame.

The UL Target Receive Power subfield indicates the expected receive signal power, measured at the AP's antenna connector and averaged over the antennas, for the HE portion of the HE TB PPDU transmitted on the assigned RU and is defined in Table 9-31j (UL Target Receive Power subfield in Trigger frame).

The Multiplexing Flag subfield indicates the number of STAs that are multiplexed on the same set of tones in the same RU, and is encoded as the number of STAs minus 1.

The total number of STAs, *NSTA*, that are scheduled to respond to the NFRP Trigger frame is calculated using Equation (9-ax1).

* *NSTA* = 18 × 2*BW ×* (*MultiplexingFlag + 1*)

where *BW* is the value of the UL BW subfield in the Common Info field of the NFRP Trigger frame, and *MultiplexingFlag* is the value of the Multiplexing Flag subfield.

***TGbe editor: Please change the subclause below as follows:***

### 35.4 MU operation

### 35.4.1 DL MU operation

### 35.4.2 UL MU operation

### 35.4.2.1 General

EHT UL MU operation allows an AP to solicit simultaneous immediate response frames from one or more non-AP EHT STAs. EHT UL MU operation expands the UL MU functionalities inherited from HE with the additional capability of responding with EHT TB PPDUs, with bandwidths up to 320 MHz.

An EHT STA follows the rules defined in 26.5.2 (UL MU operation) and additionally the rules defined below.

### 35.4.2.2 Rules for soliciting UL MU frames

***TGbe editor: Please add a new subclause header and insert new text in this location as follows:***

### 35.4.2.2.1 Allowed settings of the Trigger frame fields and TRS Control subfield

***Discussion: Changes below addresses #M2, which specifies that the same Trigger frame can be used to solicit a TB PPDU from both HE STA and EHT STA. Noting that A-PPDU (i.e., HE TB PPDU and EHT TB PPDU is for R2 we specify that this combination is not possible for R1. It also addressed #M22, which specifies that an EHT AP shall not use AID value 2007.***

An EHT AP may transmit a Trigger frame that solicits an HE TB PPDU from an HE STA and/or an EHT STA subject to the rules defined in 26.5.2.2 (Rules for soliciting UL MU frames).*(#M2)*

An EHT AP may transmit a Trigger frame that solicits an EHT TB PPDU from an EHT STA subject to the rules defined in 26.5.2.2 (Rules for soliciting UL MU frames) and the additional rules defined below. *(#M2)*

If the BaselineMACFeaturesOnly capability is 1 then an EHT AP shall not transmit a Trigger frame that solicits both an HE TB PPDU and an EHT TB PPDU.*(#M2)*

An EHT AP shall include a Special User Info field immediately after the Common Info field of a Trigger frame to indicate that the Trigger frame is soliciting an EHT TB PPDU. The AID12 subfield of the Special User Info field shall be set to 2007. An EHT AP that includes the Special User Info field in a Trigger frame shall set Special User Info Field present to 0. An EHT AP that includes the Special User Info field in a Trigger frame shall set HE/EHT P160 subfield of the Common Info Field of the Trigger frame to 0. An EHT AP that includes the Special User Info field in a Trigger frame shall set HE/EHT P160 subfield of the Common Info Field of the Trigger frame to 0.*(#M2, #M19, #M20, #M22)*

An EHT AP shall not assign an AID value of 2007 to any STA *(#M22)*

***Discussion: Change below addresses #M7, which specifies that the UL Length setting of the Trigger frame when the Trigger solicits an EHT TB PPDU as opposed to HE TB PPDU. Note that the rules are essentially identical (i.e., independently of the solicited TB PPDU variant (HE or EHT). However, since the motion explicitly calls the EHT PPDU case out the proposal is to also add the normative requirement in the normative behaviour subclause that describes solicitation of EHT TB PPDUs.***

An EHT AP shall set the UL Length subfield of a transmitted Trigger frame that solicits an EHT TB PPDU to the value given by Equation (27-11) with m = 2.

### NOTE—This is the same rule as that of an AP that transmits a Trigger frame that solicits an HE TB PPDU (see 26.5.2.2.4).*(#M7)*

***Discussion: Change below addresses #M19, #M21. Which specifies that if a Special User Info field is not present in the Trigger frame then the User Info field is an HE variant and the EHT STA transmits an HE TB PPDU. In R1, if the Special user info field is present then the EHT STA transmits an EHT TB PPDU,***

***TGbe editor: Please add a new paragraph in this location as follows:***

An EHT non-AP STA that transmits a TB PPDU shall satisfy the conditions defined in 26.5.2.3 (Non-AP STA behavior for UL MU operation). If HE/EHT P160 subfield of the Common Info field in the Trigger frame is set to 1 then the TB PPDU shall be an HE TB PPDU; otherwise, the TB PPDU shall be an EHT TB PPDU.*(#M21)*

A EHT non-AP STA shall not send an EHT TB PPDU unless it is explicitly triggered by an AP in one of the operation modes described in 26.5.2.3 (Non-AP STA behavior for UL MU operation) and the operation modes described in 35.4.2.3.3.*(#M21)*

A EHT non-AP STA shall not send an HE TB PPDU on the secondary 160MHz. (#M19)

***Discussion: Changes below address the normative behaviour for several motions and as follows:***

* ***#M7*: *which specifies that the LENGTH field in L-SIG shall be set as in baseline if the solicited PPDU is an HE TB PPDU and shall be set to the value of the UL Length field of the soliciting Trigger frame plus 2 if the solicited PPDU is an EHT TB PPDU. Noting that the addition of the plus 2 is already accounted in 36.3.11.5:*** “***For an EHT TB PPDU, the LENGTH field is set to the TXVECTOR parameter L\_LENGTH + 2”.***
* ***#M26: Which specifies the new encoding for the Starting Spatial Stream (4 bits), and Number of Spatial Streams (2 bits) and consequently the depending normative behaviour for it. Note that here there is no restriction as to what the maximum values are for the Starting Spatial Stream field, however the expectation is that there will be a capability bit that specified that SSS is up to 8 for R1, and later to be added that it can be up to 16 for R2.***
* ***#M18: Which specifies the encoding of the BW of the EHT TB PPDU.***
* ***#M23: Which specifies that Special Reuse 1 and Special Reuse 2 subfield are present in the U-SIG of the EHT TB PPDU, which in turn are provided by the solicited Trigger frame in the Special User Info field.***
* ***#M24: Which specifies that B25(UL DCM) is reserved and set to 0 for R1. For this just a note that this TXVECTOR parameter is not present suffices.***
* ***#M25: Which specifies that B39 (which is now PS160 subfield in the EHT variant User Info field) is the primary/secondary 160 subfield and that this bit, along with B7-B0 of the RU allocation subfield, specify the RU/MRU.***

***TGbe editor: Please add a new subclause header and insert new text in this location as follows:***

### 35.4.2.3.3 TXVECTOR parameters for EHT TB PPDU response to Trigger frame

An EHT non-AP STA that responds to a Trigger frame that solicits an HE TB PPDU sets the TXVECTOR parameters as defined in 26.5.2.3.3 (TXVECTOR parameters for HE TB PPDU response to Trigger frame). *(#M7)*

An EHT non-AP STA that responds to a Trigger frame that solicits an EHT TB PPDU shall set the TXVECTOR parameters below as follows:

* The FORMAT parameter is set to EHT\_TB
* The L\_LENGTH parameter is set to the value indicated by the UL Length subfield in the Common Info field of the Trigger frame.*(#M7)*
* The NUM\_STS parameter is set to the number of space-time streams indicated by the Number Of\_Spatial Streams subfield of the SS Allocation field of the EHT variant User Info field.*(#M26)*
* The STARTING\_STS\_NUM parameter is set to the value of the Starting Spatial Stream subfield in

the SS Allocation field in the EHT variant User Info field of the Trigger frame.*(#M26)*

* The PS160 parameter is set to the value of the PS160 subfield in the EHT variant User Info field of the Trigger frame. The RU location (as specified by the RU\_ALLOCATION parameter) is within the secondary 160 if the PS160 parameter is 1 and is within the primary 160 if the PS160 parameter is 0.*(#M25)*
* The SPATIAL\_REUSE\_1 and SPATIAL\_REUSE\_2 parameters are set to the values of the respective Spatial Reuse subfields in the Special User Info field of the eliciting Trigger frame.*(#M23)*
* The CH\_BANDWIDTH parameter is set to the value of the bandwidth of the EHT TB PPDU, and is obtained from the combined value of the UL BW subfield in the Common Info field and the UL BW Extension subfields in the Special User Info field (see Table 9-31k).*(#M18)*
* The RU\_ALLOCATION parameter is set as follows:
	+ If the RU is not an RA-RU or an RA-RU with Number Of RA-RU subfield of the User Info subfield of the Trigger frame set to 0, it is set to the value indicated by the RU Allocation subfield of the User Info subfield of the Trigger frame.
	+ If the RU is the k-th RU of a set of contiguous RA-RUs starting with an RA-RU with Number Of RA-RU subfield of the User Info subfield of the Trigger frame set to a nonzero value, it is set to the value indicated by the RU Allocation subfield of the corresponding User Info subfield of the Trigger frame plus k minus 1.

All other TXVECTOR parameters that are present are set as defined in 26.5.2.3.3 (TXVECTOR parameters for HE TB PPDU response to Trigger frame).

NOTE--The DCM parameter is not present in an EHT variant User Info field. *(#M24)*