IEEE P802.11
Wireless LANs

|  |
| --- |
| LB 271 Resolution for 35.5.2 |
| Date: December 10, 2022 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Yanjun Sun | Qualcomm Technologies Inc. |  |  |  |

 Abstract

This submission proposes resolutions for following CID received for TGbe LB271:

* 15247, 15252, 15420, 15572, 15573, 15574, 15575, 15763, 15764, 15765,
* 17006, 17007, 17008, 17009, 17011, 17012, 17013, 17014, 17015, 17018,
* 17019, 17020, 17021, 17022, 17023, 17024, 16132

**Revisions:**

* Rev 0: Initial version of the document.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the 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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 15247 | JINYOUNG CHUN | 35.5.2.3.3 | 595.21 | The paragraph is not clear to me. Does it mean that If the RXVECTOR parameters EHT\_LTF\_TYPE and GI\_TYPE of EHT MU PPDU, carrying the frame with the TRS Control subfield are either 4x EHT-LTF and 3.2us\_GI or 2x EHT-LTF and 1.6us\_GI. Then the EHT\_LTF\_TYPE and GI\_TYPE parameters are set to 4x EHT-LTF and 3.2us\_GI or 2x EHT-LTF and 1.6us\_GI, respectively? And not 3u2s or 1u6s, but 3.2us or 1.6us. | Clarify the text. | Revised –Agree in principle with the comment. Proposed resolution reorganizes the sentence placing commas in the appropriate locations and in line with equivalent text from IEEE802.11ax D8.0. Regarding the GI values the terms are correct (e.g., 3u2s) and defined as such in Table 36-1 (TXVECTOR and RXVECTOR parameters).**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 15247.** |
| 15252 | JINYOUNG CHUN | 35.5.2.3.3 | 595.19 | The setting of U-SIG Disregards and Validate bits between Trigger frame and TRS Control field are different.(See L36-39 P592 in D3.0 for Trigger frame) | clarify it. | Revised –Agree in principle with the comment. Proposed resolution fixes the issue.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 15252.** |
| 15420 | John Wullert | 35.5.2.3.4 | 595.60 | Missing conjunction - need "and' | Add "and" as: "If a non-AP EHT STA is solicited to send a TB PPDU by a Trigger frame and the combination of the B54 and B55 in the Common Info field, and the B39..." | Accepted |
| 15572 | Chaoming Luo | 35.5.2.1 | 590.50 | It conflicts with the fourth paragraph of 35.5.2.1, which allows an EHT AP allocates an RU or MRU that occupies the secondary 160 MHz channel for an 320Mhz EHT STA which could send an HE TB PPDU. | Remove this paragraph. | Rejected –HE variant User Info fields, which solicit HE TB PPDUs, do not support RU allocations that span over a secondary 160 MHz. Hence it is not possible to send an HE TB PPDU over the secondary 160. Only an EHT TB PPDU can be sent over a 160 MHz, as specified in several paragraphs of this subclause. No further changes are needed. |
| 15573 | Chaoming Luo | 35.5.2.3.1 | 593.42 | Change: An EHT STA shall not transmit an EHT TB PPDU if the B55 of the Common Info field is set to 1.To: An EHT STA shall not transmit an EHT TB PPDU if the B55 of the Common Info field of the soliciting Trigger frame is set to 1. | As in comment | Accepted |
| 15574 | Chaoming Luo | 35.5.2.3.1 | 593.53 | It conflicts with the fourth paragraph of 35.5.2.1, which allows a 320Mhz non-AP EHT STA transmitting a HE TB PPDU on Secondary 160 MHz. | Change to: A non-AP EHT STA shall not send an HE TB PPDU on the secondary 160 MHz unless the non-AP EHT STA is in 320MHz operating bandwidth. | Rejected –HE variant User Info fields, which solicit HE TB PPDUs, do not support RU allocations that span over a secondary 160 MHz. Hence it is not possible to send an HE TB PPDU over the secondary 160. Only an EHT TB PPDU can be sent over a 160 MHz, as specified in several paragraphs of this subclause. No further changes are needed. |
| 15575 | Chaoming Luo | 35.5.2.3.2 | 594.11 | Make it consistent and add "of the soliciting Trigger frame" after the "User Info field".Silimar issue lies in P594L22, P594L30 and P594L35. | As in comment | Revised –Agree in principle. Simply referring to the Trigger frame suffices.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 15575.** |
| 15763 | Dong Guk Lim | 35.5.2.3.1 | 593.31 | Add the B55 in the text | As in comment | Revised –These settings are already defined in table 9-45c. Sentence is removed to avoid duplication and added a reference to the table.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 15763.** |
| 15764 | Dong Guk Lim | 35.5.2.3.1 | 593.32 | All combinations of B54 and B55 except the case both B54 and B55 are set to 1 don't mean the EHT variant. Clarify it and refer the table 9-45. | As in comment | Revised –Agree with the comment. Removed sentence and cited the table as suggested. **TGbe editor: please implement changes as shown in 11-23/306r0 tagged 15764.** |
| 15765 | Dong Guk Lim | 35.5.2.3.1 | 593.42 | Add the B54 in the text. | As in comment | Rejected –Comment fails to identify a technical issue. There is no reason for adding B54 in this particular statement since both values 0 or 1 of B54 can still solicit an EHT TB PPDU. |
|  |  |  |  |  |  |  |
| 17006 | Mark RISON | 35.5.2.1 | 590.20 | "which" should be "that" | As it says in the comment | Revised –Agree in principle with the comment. Accounted for the suggested change and included some revision for better readability.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 17006.** |
| 17007 | Mark RISON | 35.5.2.1 | 590.29 | "Duplicate" should be "duplicate" | As it says in the comment. Also at line 33 | Accepted |
| 17008 | Mark RISON | 35.5.2.1 | 591.05 | "using EHT TB PPDU " missing article | As it says in the comment | Revised –Agree in principle with the comment. Accounted for the suggested change.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 17008.** |
| 17009 | Mark RISON | 35.5.2.1 | 592.02 | "using the non-HT or non-HT duplicate PPDU" should be "in a non-HT or non-HT duplicate PPDU" | As it says in the comment. Ditto at line 25 | Accepted |
| 17011 | Mark RISON | 35.5.2.1 | 592.12 | The "where" should be at the end of the previous para, not all by itself | As it says in the comment | Revised –Agree in principle with the comment. Actually “where” should be after the equation.**TGbe editor: please move “where” to be after the equation 35-2.** |
| 17012 | Mark RISON | 35.5.2.1 | 592.18 | "if the EMLSR padding delay is not updated in an EML Operating ModeNotification frame, or an updated EMLSR padding delay included in the EMLSR ParameterUpdate field of an EML Operating Mode Notification frame" -- why would EMLMR be affected by the EMLSR ParameterUpdate field? | Delete the cited text | Accepted |
| 17013 | Mark RISON | 35.5.2.1 | 592.26 | "for HT PPDU, VHT PPDU, HE PPDU, or EHT PPDU" missing article | As it says in the comment | Accepted |
| 17014 | Mark RISON | 35.5.2.1 | 592.37 | "The MSB of the Disregard InU-SIG-2 subfield is implementation specific and should be set to 0." -- there is no apparent reason to make this msb implementation-specific | Delete the cited text and delete "the four LSBs of " in the previous sentence | Rejected –The comment fails to identify a technical issue. Currently these bits are not being used for anything and as such are set to 1 (the 4 LSBs) so that the opposite value can be used in the future, while the MSB can be used for implementation specific reasons which are out of scope of the standard. Specifying them in the standard raises awareness of these particular settings. |
| 17015 | Mark RISON | 35.5.2.1 | 592.42 | "The EHT AP" should be "An EHT AP" | As it says in the comment | Accepted |
| 17018 | Mark RISON | 35.5.2.1 | 593.04 | "The AP affiliated with an AP MLD and operating on a link shall not set an ACI value in the Preferred ACsubfield in the Trigger Dependent User Info field of the User Info field of a Basic Trigger frame for a non-AP STA that is affiliated with a non-AP MLD if no TID that corresponds to this ACI is mapped to the linkfor the non-AP MLD by the TID-to-link mapping (see 35.3.7 (Link management)). " is confusing because you can't avoid setting that field | "The AP affiliated with an AP MLD and operating on a link shall not set the Preferred ACsubfield in the Trigger Dependent User Info field of the User Info field of a Basic Trigger frame for a non-AP STA that is affiliated with a non-AP MLD to an ACI for which no corresponding TID is mapped to the linkfor the non-AP MLD by the TID-to-link mapping (see 35.3.7 (Link management)). " | Accepted |
| 17019 | Mark RISON | 35.5.2.3.1 | 593.28 | "TB PPDU)where" missing space after ) | As it says in the comment | Revised –Agree in principle with the comment. Accounted for the suggested change.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 17019.** |
| 17020 | Mark RISON | 35.5.2.3.1 | 593.31 | "addressed to a non-AP STA" -- well, obviously | Delete the cited text | Revised –The cited text has been deleted and replaced with a reference to table 9-45c based on the resolution to CID 15763.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 15763, same as above** |
| 17021 | Mark RISON | 35.5.2.3.1 | 593.22 | "The User Info field is anHE variant addressed to a non-AP STA if the B39 of the User Info field is set to 0 and the B54 of CommonInfo field is set to 1 in the Trigger frame; otherwise, it is an EHT variant." contradicts Table 9-45c--Valid combinations of B54 and B55 in the Common Info field, B39 in the UserInfo field, and solicited TB PPDU format: if B39 and B54 are both 0 then it's also an HE variant | Delete the cited text and DO NOT DUPLICATE INFORMATION BECAUSE THIS LEADS TO SPEC ROT | Revised –Disagree in principle with the comment that the text is conflicting. In fact they are aligned. However, agree that it is duplication, hence removing the sentence and simply providing a reference to the table.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 17021, same as above for 15763** |
| 17022 | Mark RISON | 35.5.2.3.1 | 593.34 | "If a non-AP EHT STA receives an EHT variant User Info field in a Trigger frame that is not MU-RTSTrigger frame in which the AID12 subfield matches its AID, then the STA shall respond with an EHT TBPPDU. If a non-AP EHT STA receives an HE variant User Info field in a Trigger frame that is not MU-RTSTrigger frame in which the AID12 subfield matches its AID, then the STA shall respond with an HE TBPPDU." precedence confusing | Change to "If a non-AP EHT STA receives an EHT variant User Info field in a Trigger frame in which the AID12 subfield matches its AID, then if the Trigger frame is not MU-RTSTrigger frame, the STA shall respond with an EHT TBPPDU. If a non-AP EHT STA receives an HE variant User Info field in a Trigger frame in which the AID12 subfield matches its AID, then if the Trigger frame is not MU-RTSTrigger frame, the STA shall respond with an HE TBPPDU." | Revised –Agree in principle with the comment. Accounted for the suggested change and included some minor editorial improvements.**TGbe editor: please implement changes as shown in 11-23/306r0 tagged 17022.** |
| 17023 | Mark RISON | 35.5.2.3.1 | 593.47 | "A non-AP EHT STA shall not send an EHT TB PPDU unless it is explicitly triggered by an AP in theoperation modes described in 35.5.2.3.2 (TXVECTOR parameters for EHT TB PPDU response to Triggerframe)." -- well obviously you don't tx TB unless you're triggered to do so | Delete the cited text | Rejected –The comment fails to identify a technical issue. This statement forbids STAs from sending TB PPDUs without being solicited for such PPDU.  |
| 17024 | Mark RISON | 35.5.2.3.1 | 593.52 | "A non-AP EHT STA shall not send an HE TB PPDU on the secondary 160 MHz." -- the non-AP STA just does what it's told in the Trigger frame, so this should be an EHT AP requirement | Delete the cited text | Rejected –The AP ensures that the Trigger frame soliciting a TB PPDU in the secondary 160 MHz includes an EHT variant that provides the parameters for such TB PPDU to be an EHT TB PPDU. This statement forbids the STA, for any reason, to transmit an HE TB PPDU in that secondary 160 MHz. In addition, an equivalent statement is available for the AP side as well: “An EHT AP shall not trigger a non-AP EHT STA to send an HE TB PPDU that covers the secondary 160 MHz.” |
| 16132 | Jian Yu | 35.5.2.3.1 | 593.44 | Enable UORA for 320MHz TB transmission. | Define a new AID for EHT STA to do UORA when BW=320MHz | Rejected –This topic has been intensively discussed in the group. A brief recap: using UORA in 320 MHz is not spectrally efficient and introduces unfairness w.r.t. HE STAs. The solutions to these problems are non-trivial and past SP results showed that majority of the group prefer not to enable such expansion. |

* + 1. **EHT UL MU operation**

**35.5.2.1 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 that is a mesh STA shall not transmit or receive EHT TB PPDUs.

An EHT STA with dot11EHTPartialBWULMUMIMOImplemented equal to true shall set the Partial Bandwidth UL MU-MIMO subfield in the EHT PHY Capabilities Information field in the EHT Capabilities element to 1. An EHT STA with dot11EHTPartialBWULMUMIMOImplemented equal to false shall set the Partial Bandwidth UL MU-MIMO subfield in the EHT PHY Capabilities Information field in the EHT Capabilities element to 0.

An EHT AP shall not transmit a triggering frame in the 6 GHz band that allocates an RU or MRU in the secondary 160 MHz channel to a non-AP EHT STA, unless the AP has received from the non- AP EHT STA an EHT Capabilities element with the Support For 320 MHz In 6 GHz subfield in the EHT PHY Capabilities Information field equal to 1 and operating bandwidth of the non-AP EHT STA is 320 MHz.*[#17006]*

A non-AP EHT STA with dot11HEDeviceClass equal to ClassA shall meet the Class A requirements specified in 36.3.16 (Transmit requirements for PPDUs sent in response to a triggering frame) when transmitting an EHT TB, non-HT or non-HT duplicate PPDU*[#17007]* in response to a triggering frame. A non-AP EHT STA with dot11HEDeviceClass equal to ClassB shall meet the Class B requirements specified in

36.3.16 (Transmit requirements for PPDUs sent in response to a triggering frame) when transmitting an EHT TB, non-HT or non-HT duplicate PPDU*[#17007]* in response to a triggering frame.

NOTE—A non-AP EHT STA uses the Device Class subfield in the HE PHY Capabilities Information field in the HE Capabilities element to indicate its device class based on dot11HEDeviceClass. See 26.5.2.1 (General).

An EHT AP shall not set the UL EHT-MCS subfield of an EHT variant User Info field to 15 in a transmitted Trigger frame if the RU assigned by that User Info field is used for UL MU MIMO transmission.

An EHT AP shall not set the UL EHT-MCS subfield of an EHT variant User Info field to 14 in a transmitted Trigger frame.

A non-AP EHT STA shall set the EHT TRS Support subfield in the EHT MAC Capabilities Information field in the EHT Capabilities element to 1 if its dot11EHTTRSOptionImplemented is true; otherwise the STA shall set it to 0.

An EHT AP shall not trigger a non-AP EHT STA to send an HE TB PPDU that covers the secondary 160 MHz.

**35.5.2.2 Rules for soliciting UL MU frames**

**35.5.2.2.1 General**

An EHT STA shall follow the rules defined in 26.5.2.2.1 (General), where

Rules related to HE STAs also apply to EHT STAs.

Rules related to triggering frames also apply to triggering frames soliciting EHT TB PPDUs.

Rules related to HE MU and HE TB PPDUs also apply to EHT MU and EHT TB PPDUs, respectively.

An EHT AP shall not transmit an HE PPDU that carries a Trigger frame soliciting an EHT TB PPDU. An EHT AP shall not transmit an EHT PPDU that carries a Trigger frame soliciting an HE TB PPDU.

An EHT AP shall not transmit a Trigger frame soliciting an OFDMA transmission using an EHT TB PPDU*[#17008]* that uses UL MU-MIMO within an RU or MRU to a non-AP EHT STA from which the AP has not received an EHT Capabilities element with the Partial Bandwidth UL MU-MIMO subfield of the EHT PHY Capabilities Information field equal to 1.

In a 40 MHz, 80 MHz, 160 MHz, or 320 MHz EHT TB PPDU, an AP shall not allocate to a 20 MHz operating non-AP STA an RU or MRU that is not supported by the STA as indicated in 36.3.2.6 (RU and MRU restrictions for 20 MHz operation). An AP shall follow the rules defined in 36.3.2.5 (20 MHz operating non-AP EHT STAs participating in wider bandwidth OFDMA), 36.3.2.7 (80 MHz operating non- AP EHT STAs participating in wider bandwidth OFDMA), and 36.3.2.8 (160 MHz operating non-AP EHT STAs participating in wider bandwidth OFDMA) when assigning an RU or MRU to a non-AP EHT STA whose operating bandwidth is smaller than the BSS operating channel width.

**35.5.2.2.2 Requirements for allocating resources**

An EHT AP shall follow the requirements for allocating resources specified in 26.5.2.2.2 (Requirements for allocating resources) where rules related to HE STAs also apply to EHT STAs, and rules related to HE TB PPDUs also apply to EHT TB PPDUs, except that the negotiation of block ack bitmap lengths is additionally defined in [35.4.2 (Block ack procedures)](#bookmark118).

* + - * 1. **Padding for a triggering frame**

A Trigger frame may include the Padding field 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, shall be at least two octets in length and shall be set to all 1s. If the Padding field is present in a Trigger frame, its length shall be computed as described below.

An EHT AP shall ensure that there is sufficient padding in a triggering frame as specified in 26.5.2.2.3 (Padding for a triggering frame) if the triggering frame is neither an initial Control frame of a frame exchange sequence with a non-AP MLD operating in the EMLSR mode, nor an initial frame of a frame exchange sequence with a non-AP MLD operating in the EMLMR mode.

When an EHT AP of an AP MLD transmits an initial Control frame to initiate a frame exchange with a non- AP MLD operating in the EMLSR mode, the AP shall ensure that the number of bits in the PSDU following the last bit of the User Info field addressed to the non-AP MLD is at least *LPAD* *MAC* defined in [Equation (35-](#bookmark122) [1)](#bookmark122) together with the padding requirement defined in 26.5.2.2.3 (Padding for a triggering frame).

*EMLSR*\_*PADDING*\_*DELAY* is the value of the EMLSR Padding Delay subfield in the EML Capabilities subfield in the Multi-Link element if the EMLSR Padding Delay is not updated in an EML Operating Mode Notification frame, or an updated EMLSR Padding Delay included in the EMLSR Parameter Update field of an EML Operating Mode Notification frame.

*NDBPS* is defined in Table 17-4 (Modulation-dependent parameters).

NOTE—The initial Control frame of a frame exchange sequence to initiate a frame exchange with a non-AP MLD operating in the EMLSR mode is sent in a non-HT or non-HT duplicate PPDU.*[#17009]*

When an EHT AP of an AP MLD transmits a triggering frame using a non-HT or non-HT duplicate PPDU as an initial frame to initiate a frame exchange with a non-AP MLD operating in EMLMR mode, the AP shall ensure that the number of bits in the PSDU following the last bit of the User Info field addressed to the non-AP MLD is at least *LPAD* *MAC* defined in [Equation (35-1)](#bookmark122) together with the padding requirement defined in 26.5.2.2.3 (Padding for a triggering frame).



where*[#17011]*

*EMLMR*\_*DELAY* is the value of the EMLMR Delay subfield in the EML Capabilities subfield in the Multi-Link element.*[#17012]*

*NDBPS* is defined in Table 17-4 (Modulation-dependent parameters).

NOTE—The initial frame of a frame exchange sequence to initiate a frame exchange with a non-AP MLD operating in EMLMR mode can be sent in a non-HT *[#17009]*, non-HT duplicate, HT, VHT, HE, or EHT PPDU. However, for an HT, VHT, HE, or EHT PPDU*[#17013]*, there are other padding methods for the initial frame, so the above padding method only applies to the case where the initial frame is sent in a non-HT or non-HT duplicate PPDU*[#17009]*.

**35.5.2.2.4 Allowed settings of the Trigger frame fields and TRS Control subfield**

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.

An EHT AP that includes the Special User Info field in a Trigger frame shall set all bits of the Disregard In U-SIG-1 subfield and the four LSBs of the Disregard In U-SIG-2 subfield to 1. The MSB of the Disregard In U-SIG-2 subfield is implementation specific and should be set to 0.

An EHT AP shall not transmit a Trigger frame that solicits both an HE TB PPDU and an EHT TB PPDU. An EHT*[#17015]* AP shall not transmit a Trigger frame that contains a User Info field whose AID12 subfield is equal to 0 or 2045 unless both B54 and B55 in the Common Info field of the Trigger frame are equal to 1.

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 Flag subfield to 0 and the Special User Info field shall be placed immediately after the Common Info field. An EHT AP shall set the value of B54 in the Common Info field of a Trigger frame to 1 if there exists any HE variant User Info field in the Trigger frame. Otherwise, the EHT AP shall set the value of B54 in the Common Info field of the Trigger frame to 0.

NOTE 1—An EHT AP does not assign an AID value of 2007 to any STA or non-AP MLD (see [35.15 (EHT BSS](#bookmark147) [operation)](#bookmark147)).

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 , except that TXTIME is defined by Equation (36-110).

NOTE 2—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 (Allowed settings of the Trigger frame fields and TRS Control field)).

An AP shall not send a frame with a TRS Control subfield that solicits an EHT TB PPDU to a non-AP STA from which the AP has not received an EHT MAC Capabilities Information field in the EHT Capabilities element with the EHT TRS Support subfield equal to 1.

An AP shall not send an EHT MU PPDU with a 4996-tone RU if the 4996-tone RU carries a TRS Control subfield.

The AP affiliated with an AP MLD and operating on a link shall not set the Preferred AC subfield in the Trigger Dependent User Info field of the User Info field of a Basic Trigger frame for a non- AP STA that is affiliated with a non-AP MLD to an ACI for which no corresponding TID is mapped to the link for the non-AP MLD by the TID-to-link mapping (see [35.3.7 (Link management)](#bookmark50)).*[#17018]*

NOTE 3—If one of the two TIDs matching the indicated Preferred AC is not mapped to the link where the Trigger frame is sent, then data frames belonging to the unmapped TID cannot be transmitted on that link, following [35.3.7 (Link](#bookmark50) [management)](#bookmark50).

**35.5.2.2.5 AP access procedures for UL MU operation**

An EHT AP shall follow the AP access procedures for UL MU operation as specified in 26.5.2.2.5 (AP access procedures for UL MU operation).

**35.5.2.3 Non-AP STA behavior for UL MU operation**

**35.5.2.3.1 General**

A non-AP EHT STA that transmits a TB PPDU shall satisfy the conditions defined in 26.5.2.3.1 (General),

26.5.2.3.2 (Conditions for not responding with an HE TB PPDU), 26.5.2.3.5 (RA field for frames carried in an HE TB PPDU), 26.5.2.4 (A-MPDU contents in an HE TB PPDU), and [35.5.2.3.4 (Conditions for not](#bookmark126) [responding with a TB PPDU)](#bookmark126) where*[#17019]* rules related to HE TB PPDUs also apply to EHT TB PPDUs. A User Info field that is addressed to a non-AP STA is either an HE variant or EHT variant (see Table 9-45c).  *[#15763, 15764, 17021]*

If a non-AP EHT STA receives an EHT variant User Info field in a Trigger frame in which the AID12 subfield matches its AID, then if the Trigger frame is not an MU RTS Trigger frame, the STA shall respond with an EHT TB PPDU. If a non-AP EHT STA receives an HE variant User Info field in a Trigger frame in which the AID12 subfield matches its AID, then if the Trigger frame is not an MU-RTS Trigger frame, the STA shall respond with an HE TB PPDU.*[#17022]*

An EHT STA shall not transmit an EHT TB PPDU if the B55 of the Common Info field of the soliciting Trigger frame is set to 1.*[#15573]*

NOTE—A non-AP EHT STA is an HE STA, so the non-AP EHT STA might contend for an RA-RU and transmit an HE TB PPDU, if the STA receives an HE variant User Info field that allocates RA-RU(s) in a Trigger frame (see 26.5.4 (UL OFDMA-based random access (UORA))).

A non-AP EHT STA shall not send an EHT TB PPDU unless it is explicitly triggered by an AP in the operation modes described in [35.5.2.3.2 (TXVECTOR parameters for EHT TB PPDU response to Trigger](#bookmark124) [frame)](#bookmark124).

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

**35.5.2.3.2 TXVECTOR parameters for EHT TB PPDU response to Trigger frame**

A non-AP EHT 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).

A non-AP EHT 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 BSS\_COLOR parameter is set as follows:

If the Trigger frame was received in an HE or EHT PPDU, then the BSS\_COLOR parameter is set to the value of the RXVECTOR parameter BSS\_COLOR of the PPDU.

Otherwise, the BSS\_COLOR parameter is set to the value of the active BSS color as defined in

26.11.4 (BSS\_COLOR).

The L\_LENGTH parameter is set to the value indicated by the UL Length subfield in the Common Info field of the Trigger frame.

The NUM\_STS parameter is set to the number of spatial streams indicated by the Number Of Spatial Streams subfield of the SS Allocation field of the EHT variant User Info field of the Trigger frame*[#15575]*.

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.

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 Trigger frame*[#15575]*.

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 Bandwidth Extension subfield in the Special User Info field of the Trigger frame*[#15575]* (see Table 9-50a (UL Bandwidth Extension subfield encoding)).

The RU\_ALLOCATION parameter is set to the value indicated by the RU Allocation subfield and the PS160 subfield of the User Info subfield of the Trigger frame.

The TB\_DISREGARD\_IN\_USIG1, TB\_VALIDATE\_IN\_USIG2, and

TB\_DISREGARD\_IN\_USIG2 parameters are set to the value of the Disregard In U-SIG-1, Validate In U-SIG-2, and Disregard In U-SIG-2 subfields, respectively, in the U-SIG Disregard And Validate subfield in the Special User Info field of the Trigger frame*[#15575]*.

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.

**35.5.2.3.3 TXVECTOR parameters for EHT TB PPDU response to TRS Control subfield**

A non-AP STA transmitting an EHT TB PPDU in response to a frame containing a TRS Control subfield shall set the TXVECTOR parameters as follows:

The FORMAT parameter is set to EHT\_TB if the RXVECTOR parameter FORMAT of the PPDU carrying the frame with the TRS Control subfield is equal to EHT\_MU.

The TRIGGER\_METHOD parameter is set to TRS.

The L\_LENGTH parameter is computed as described in Equation (27-11) with *m* = 2 using the

TXTIME value. The TXTIME is defined by Equation (36-110) where *NSYM* is set to *FVAL* + 1, where

*FVAL* is the value of the UL Data Symbols subfield of the TRS Control subfield.

The RU\_ALLOCATION parameter is set to the value indicated by the RU Allocation subfield of the TRS Control subfield and a PS160 bit which is determined based on the RU allocation in the EHT MU PPDU carrying the TRS control subfield according to [Table 35-2 (PS160 for RU allocation in](#bookmark125) [EHT TRS)](#bookmark125).

The MCS parameter is set to the value of the UL MCS subfield of the TRS Control subfield.

The CH\_BANDWITDTH parameter is set to the value of the RXVECTOR parameter CH\_BANDWIDTH of the soliciting DL EHT PPDU (see Table 36-1 (TXVECTOR and RXVECTOR parameters)).

The BSS\_COLOR parameter is set to the values of the RXVECTOR parameter BSS\_COLOR of the soliciting DL EHT PPDU.

The NUM\_EHT\_LTF parameter is set to 1.

The STARTING\_STS\_NUM parameter is set to 0.

The NUM\_STS parameter is set to 1.

The FEC\_CODING parameter is set to BCC\_CODING if the RU Allocation subfield indicates an RU or MRU that is smaller than a 484-tone RU; otherwise it is set to LDPC\_CODING.

The LDPC\_EXTRA\_SYMBOL parameter is set to 0 if the RU Allocation subfield indicates an RU or MRU that is smaller than a 484-tone RU; otherwise it is set to 1.

The SPATIAL\_REUSE parameter is set to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED.

If the received EHT Default PE Duration subfield of the EHT Operation Parameters field in the EHT Operation element transmitted by the AP with which the non-AP STA is associated is set to 0, the DEFAULT\_PE\_DURATION parameter is set to the default PE duration value indicated by the AP in the Default PE Duration subfield of the HE Operation element it transmits; Otherwise, the DEFAULT\_PE\_DURATION parameter is set to 20 µs.

The TXOP\_DURATION parameter is set as defined in 26.11.5 (TXOP\_DURATION).

The TB\_DISREGARD\_IN\_USIG1, TB\_VALIDATE\_IN\_USIG2, and TB\_DISREGARD\_IN\_USIG2 parameters are all set to 1 except for the MSB of the TB\_DISREGARD\_IN\_USIG2 that is set to 0.*[#15252]*

If the RXVECTOR parameters EHT\_LTF\_TYPE and GI\_TYPE of the EHT MU PPDU carrying the frame with the TRS Control subfield are either 4 EHT-LTF and 3u2s\_GI, respectively, or 2 EHT- LTF and 1u6s\_GI, respectively, then the EHT\_LTF\_TYPE and GI\_TYPE parameters are set to 4 EHT-LTF and 3u2s\_GI, respectively. Otherwise, the EHT\_LTF\_TYPE and GI\_TYPE parameters are set to 2 EHT-LTF and 1u6s\_GI, respectively.*[#15247]*

The TXPWR\_LEVEL\_INDEX parameter is set to a value based on the computed transmission power (see 36.3.16.2 (Power pre-correction)) for an EHT TB PPDU, the value of the AP Tx Power subfield of the TRS Control subfield and the UL Target Receive Power subfield of the TRS Control subfield.

NOTE—A non-AP STA transmitting an EHT TB PPDU in response to a frame carrying a TRS Control subfield considers that both the physical CS and the virtual CS are set to 0 (see [35.5.2.4 (UL MU CS mechanism for EHT STAs)](#bookmark127)).

**Table 35-2—PS160 for RU allocation in EHT TRS**

|  |  |
| --- | --- |
| **Input** | **Output** |
| **RU size of the RU or MRU indicated by the RU Allocation subfield in the TRS control subfield** | **The location of the 160 MHz channel with more data tones of the RU or MRU that carries the frame with the TRS control subfield** | **PS160** |
| 2996+484-tone | Low 160 MHz | 0 |
| 2996+484-tone | High 160 MHz | 1 |
| 3996-tone or 3996+484-tone | Low 160 MHz | 1 |
| 3996-tone or 3996+484-tone | High 160 MHz | 0 |
| Smaller than or equal to 2996-tone | Primary 160 MHz | 0 |
| Smaller than or equal to 2996-tone | Secondary 160 MHz | 1 |

**35.5.2.3.4 Conditions for not responding with a TB PPDU**

If a non-AP EHT STA is solicited to send a TB PPDU by a Trigger frame and the combination of the B54 and B55 in the Common Info field, and the*[#15420]* B39 in the User Info field addressed to it in the Trigger frame does not match any of the combinations of the values specified in the rows in Table 9-45c (Valid combinations of B54 and B55 in the Common Info field, B39 in the User Info field, and solicited TB PPDU format), then the STA shall not respond with a TB PPDU to the Trigger frame. If B39 is equal to 1, then the non-AP EHT STA shall not respond with an EHT TB PPDU unless the bandwidth for the solicited EHT TB PPDU is specified as 320 MHz in the Trigger frame.

**UL MU CS mechanism for EHT STAs**

An EHT STA shall follow the rules defined in 26.5.2.5 (UL MU CS mechanism), except that the EHT STA shall use the rules defined in 36.3.21.6.4 (Per 20 MHz CCA sensitivity) instead of those defined in 27.3.20.6.5 (Per 20 MHz CCA sensitivity) when CCA is performed on any nonpunctured 20 MHz subchannel in an EHT BSS.

Specifically, if the CS Required subfield in a Trigger frame is 1, then the non-AP STA shall consider the status of the CCA (using energy detect defined in 36.3.21.6.4 (Per 20 MHz CCA sensitivity) and the virtual carrier sense (NAV)) during the SIFS between the PPDU that contains the Trigger frame and the PPDU sent in response to the Trigger frame. In this case, the non-AP STA shall sense the medium using energy detect after receiving the PPDU that contains the Trigger frame (i.e., during the SIFS), and it shall perform the energy detect at least in the subchannel that contains the non-AP STA’s UL allocation, where the sensed subchannel consists of one or more occupied 20 MHz channels. The non-AP STA may transmit the solicited PPDU if all the occupied 20 MHz channels containing the RUs allocated in the Trigger frame are considered idle. If the non-AP STA detects that any of the occupied 20 MHz channels containing the allocated RUs is not idle, then the non-AP STA shall not transmit.