IEEE P802.11
Wireless LANs

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| CR for EHT UL MU Operation |
| Date: January 22, 2022 |
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 Abstract

This submission proposes resolutions for the following 11 CIDs received for TGbe CC36:

5780, 5851, 7792, 8054, 5112, 5491, 6803, 6806, 8135, 7065, 7066

Revisions:

* Rev 0: Initial version of the document.
* Rev 1-3: minor revision
* Rev 4: add some text in yellow

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** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5851 | Lei Wang | 286.29 | 35.4.2.2.1 | The subsection title has the text "... and TRS Control subfield". However, the subsection does not have any text mentioning TRS Control Subfield. | Either add text to specify the TRS Control Subfield settings or delete it from the titel line. | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS.TGbe editor:Please implement changes as shown in this document. |
| 7792 | Yanjun Sun | 286.55 | 35.4.2.2.1 | There is no normative text defined for TRS besides this NOTE. Please clarify whether EHT inherits rules from HE or define EHT specific rules. | As in comment | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS.TGbe editor:Please implement changes as shown in this document. |
| 8054 | Yuchen Guo | 287.14 | 35.4.2.3 | The TXVECTOR setting for EHT TB PPDU response to TRS control subfield is missing | Please add the corresponding description | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS.TGbe editor:Please implement changes as shown in this document. |
| 5780 | Laurent Cariou | 286.29 | 35.4.2.2.1 | TRS functionality should not be extended/modified to trigger an EHT PPDU as there is already a mandatory mechanism, the trigger frame, that is widely used and that was already extended to trigger an EHT PPDU. The TBD was removed right before D1.0 with the assumption that the 11be group had not yet decided whether that was an R1 feature or not. A new line got added for that in document 546 to reflect that situation. | Remove all mentions in the spec where TRS is mentioned to trigger an EHT PPDU. | Revised-TRS is more efficient than the trigger frame in some scenarios. Related text is added in this document to define EHT TRS. Besides, a separate capability bit is added in the EHT MAC capabilities information field to support it as an optional feature.TGbe editor:Please implement changes as shown in this document. |
| 5112 | Geonjung Ko | 505.54 | 36.3.14 | Procedure to solicit an EHT TB PPDU using a TRS Control subfield is missing. | Define the procedure or remove TRS. | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS.TGbe editor:Please implement changes as shown in this document. |
| 5491 | Jian Yu | 484.41 | 36.3.13.3.6 | Define EHT TRS | as in comment | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS.TGbe editor:Please implement changes as shown in this document. |
| 6803 | ron porat | 479.1 | 36.3.13.3.1 | The rule for selecting coding type for an EHT TB PPDU in response to TRS control subfield is currently undefined for EHT - a new sub-clause "TXVECTOR parameters for EHT TB PPDU in response to TRS Control subfield" is needed under 35.4.2.3, and a reference to this sub-clause can be added in 36.3.13.3.1. | Suggest to add a placeholder sub-clause under 35.4.2.3 as described in comment, and include a reference to this in 36.3.13.3.1 | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS, and related references are added in clause 36.TGbe editor:Please implement changes as shown in this document. |
| 6806 | ron porat | 484.43 | 36.3.13.3.6 | Incorrect reference to 35.4.2.3.1 for EHT TB PPDU parameters in response to TRS Control subfield (referred sub-clause only covers trigger frame) - need to add a new (placeholder) sub-clause in clause 35 and reference it. | As in comment | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS, and related references are added in clause 36.TGbe editor:Please implement changes as shown in this document. |
| 8135 | yujin noh | 484.43 | 36.3.13.3.6 | not correct reference. It should be "TXVECTOR parameters for EHT TB PPDU response to TRS Control subfield" which is not defined yet. Add the corresponding subclause and refer it properly. | as in comment | Revised-Agree in principle with the comment. Related text is added in this document to define EHT TRS, and related references are added in clause 36.TGbe editor:Please implement changes as shown in this document. |
| 7065 | Sigurd Schelstraete | 286.23 | 35.4.1.1 | "rules defined below" is too vague | Include actual reference. | Revised-This comment has already been resolved in 11-21/662r4, which was approved during the comment collection phase for Draft P802.11be\_D1.0.TGbe editor:No change is needed in this document to resolve this comment. |
| 7066 | Sigurd Schelstraete | 286.38 | 35.4.1.1 | Shouldn't there be a capability bit associated with "dot11EHTBaseLineFeaturesImplementedOnly"? How else will the AP know a STA can not do both HE and EHT TB PPDU? | Clarify and add capability bit if needed | Rejected – This rule is imposed on the AP itself, and it does not depend on the capability of the non-AP STA. |

***TGbe editor: Please note baselines are REVme D1.0 and 11be D1.4***

**26.5.2.3.4 TXVECTOR parameters for HE TB PPDU response to TRS Control subfield**

A non-AP STA transmitting an HE 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 HE\_TB if the RXVECTOR parameter FORMAT of the PPDU carrying the frame with the TRS Control subfield is HE\_MU, HE\_SU, or HE\_ER\_SU

* + 1. **EHT UL MU operation(#1088)**
			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.

(#1088)An EHT STA that is a mesh STA shall not transmit or receive EHT TB PPDUs.

(#1088)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.

(#1088)An EHT AP shall not transmit a triggering frame in the 6 GHz band which allocates an RU/MRU that occupies 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 the non-AP EHT STA is in 320 MHz operating bandwidth.

(#1088)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 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 in response to a triggering frame.

(#1088)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.

* + - 1. **Rules for soliciting UL MU frames**
				1. **General(#1088)**

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.

(#7828)An EHT AP with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not transmit an HE PPDU that carries a Trigger frame soliciting an EHT TB PPDU.

(#7828)An EHT AP with dot11EHTBaseLineFeaturesImplementedOnly equal to true 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 EHT TB PPDU that uses UL MU- MIMO within an RU/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.

(#4653)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/MRU that is not supported by the STA as indicated in 36.3.2.6 (RU and MRU restrictions for 20 MHz operation(#3276)). An AP shall follow the rules defined in 36.3.2.5 (20 MHz operating non-AP EHT STAs(#1244)(#1254)), 36.3.2.7 (80 MHz operating non-AP EHT STAs(#1244)(#1254)), and 36.3.2.8 (160 MHz operating non-AP EHT STAs(#1244)(#1254)) when assigning an RU/MRU to a non-AP EHT STA whose operating bandwidth is smaller than the BSS operating channel width.

* + - * 1. **Requirements for allocating resources(#1088)**

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 [35.3.7.2.2 (Negotiation of block ack bitmap lengths)](#bookmark29).

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

(#1088)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.

(#6998)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, if dot11EHTBaseLineFeaturesImplementedOnly is equal to true. The MSB of the Disregard In U-SIG-2 subfield is implementation specific and should be set to 0 if dot11EHTBaseLineFeaturesImplementedOnly is equal to true.

(#7912)An EHT AP with dot11EHTBaseLineFeaturesImplementedOnly equal to true shall not transmit a Trigger frame that solicits both an HE TB PPDU and an EHT TB PPDU. (#5201)The EHT 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(#4327) 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.

(#6743)A non-AP EHT STA that transmits a TB PPDU shall satisfy the conditions defined in 26.5.2.3 (Non- AP STA behavior for UL MU operation).

(#7913)NOTE 1—An EHT AP does not assign an AID value of 2007 to any STA (see [35.14 (EHT BSS operation)](#bookmark87)).

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 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))(#1088).

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 that is allocated to more than one STA (DL MU-MIMO) carrying a TRS Control subfield.

**35.4.2.2.5 AP access procedures for UL MU operation(#1088)**

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).

* + - 1. **Non-AP STA behavior for UL MU operation**
				1. **General(#1088)**

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), and 26.5.2.4 (A-MPDU contents in an HE TB PPDU) where 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. The User Info field is an HE variant addressed to a non-AP STA if the B39 of the User Info field is set to 0 and the B54 of Common Info field is set to 1 in the Trigger frame; otherwise, it is an EHT variant.

If a non-AP EHT STA receives an EHT variant User Info field in a Trigger frame that is not MU-RTS Trigger frame in which the AID12 subfield matches its AID, then (#7914)the STA shall respond with an EHT TB PPDU. (#6514)If a non-AP EHT STA receives an HE variant User Info field in a Trigger frame that is not MU-RTS Trigger frame in which the AID12 subfield matches its AID, then (#7914)the STA shall respond with an HE TB PPDU.

(#7896)An EHT STA shall not transmit an EHT TB PPDU if the B55 of the Common Info field is set to 1.

(#6514)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 (#4199)in the operation modes described in [35.4.2.3.2 (TXVECTOR parameters for EHT TB PPDU response to](#bookmark68) [Trigger frame)](#bookmark68).

(#4200)An EHT AP shall not trigger a non-AP EHT STA to send an HE TB PPDU that covers the secondary 160 MHz.

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

* + - * 1. **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 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 (#6079)spatial streams indicated by the Number Of Spatial Streams subfield of the SS Allocation field of the EHT variant User Info field.

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.

(#7915)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.

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 (#7916)the UL Bandwidth Extension subfield in the Special User Info field (see Table 9-53d (Mapping from Special User Info field to U-SIG-1 and U-SIG-2 fields in the EHT TB PPDU(#4607))).

(#4201)The RU\_ALLOCATION parameter is set to the value indicated by the RU Allocation subfield (#7915)and the PS160 subfield of the User Info subfield of the Trigger frame.

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.

**35.4.2.3.3 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 (36-17) 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 of the RU Allocation subfield of the TRS Control subfield. The RU location is specified by the RU\_ALLOCATION parameter 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 35-1.

— 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

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

— All U-SIG Disregarded and Validate bits are set to 1

— If the RXVECTOR parameters EHT\_LTF\_TYPE and GI\_TYPE of EHT MU PPDU, carrying the frame with the TRS Control subfield are either: 4xEHT-LTF and 3u2s\_GI, respectively; or 2xEHT-LTF and 1u6s\_GI, respectively; then the EHT\_LTF\_TYPE and GI\_TYPE parameters are set to 4xEHT-LTF and 3u2s\_GI, respectively. Otherwise, the EHT\_LTF\_TYPE and GI\_TYPE parameters are set to 2xEHT-LTF and 1u6s\_GI, respectively.

— 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.

Table 35-1 – PS160 for RU Allocation in EHT TRS

|  |  |
| --- | --- |
| **Input** | **Output** |
| **RU Size of the RU/MRU indicated by the RU Allocation subfield in the TRS control subfield** | **The location of the 160MHz channel with more data tones of the RU/MRU that carries the frame with the TRS control subfield**  | **PS160** |
| 2×996+484-tone | Low 160MHz | 0 |
| 2×996+484-tone | High 160MHz | 1 |
| 3×996-tone or 3×996+484-tone | Low 160MHz | 1 |
| 3×996-tone or 3×996+484-tone | High 160MHz | 0 |
| 4×996-tone | Any | 1 |
| Smaller than or equal to 2×996-tone | Primary 160MHz | 0 |
| Smaller than or equal to 2×996-tone | Secondary 160MHz | 1 |

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 26.5.2.5 (UL MU CS mechanism)).

* + - * 1. **Conditions for not responding with a TB PPDU(#4839)**

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, the B39 in the User Info field addressed to it(#7917) in the Trigger frame does not match any of the combinations of the values specified in the rows in Table 9-50a (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(#5558), then the non-AP EHT STA shall not respond with an HE or EHT TB PPDU unless the bandwidth for the solicited EHT TB PPDU is specified as 320 MHz in the Trigger frame.

* + - 1. **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 36.3.20.6.4 (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 36.3.20.6.4 (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.

* **Control subfield variants of an A-Control subfield**
* **TRS Control**

The Control Information subfield in a TRS Control subfield contains triggered response scheduling (TRS) information for soliciting an HE TB PPDU that follows an HE MU PPDU, HE SU PPDU or HE ER SU PPDU carrying the Control subfield (see 26.5.2.2 (Rules for soliciting UL MU frames)) or for soliciting an EHT TB PPDU that follows an EHT MU PPDU carrying the Control subfield (see 35.4.2.2 (Rules for soliciting UL MU frames). See 26.5.2.4 (A-MPDU contents in an HE TB PPDU) for details on allowed content in an A-MPDU carried in an HE TB PPDU and in an EHT TB PPDU. The format of the subfield is shown in Figure 9-22a (Control Information subfield format in a TRS Control subfield).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0            B4 | B5             B12 | B13          B17 | B18                  B22 | B23      B24 | B25 |
|  | UL Data Symbols | RU Allocation | AP Tx Power | UL Target Receive Power(#24417) | UL MCS | Reserved |
| Bits: | 5 | 8 | 5 | 5 | 2 | 1 |
| * **Control Information subfield format in a TRS Control subfield**
 |

NOTE—A TRS Control subfield is not included in a PPDU that is not an HE PPDU or an EHT PPDU.(#24425)

The UL Data Symbols subfield indicates the number of OFDM symbols in the Data field of the HE TB PPDU response or EHT TB PPDU response and is set to the number of OFDM symbols minus 1.

The RU Allocation subfield indicates the resource unit (RU) assigned for transmitting the HE TB PPDU response or EHT TB PPDU response and the encoding is defined in 9.3.1.22.1 (General).

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 or the EHT portion of the EHT TB PPDU transmitted on the assigned RU as defined in Table 9-24a (UL Target Receive Power subfield in TRS Control field).

|  |
| --- |
| * **UL Target Receive Power subfield in TRS Control field**
 |
| **UL Target Receive Power subfield** | **Description** |
| 0–30 | The expected receive signal power, in units of dBm, is *Targetpwr* = –90 + 2 × *Fval*, where *Fval* is the subfield value |
| 31 | The STA transmits the TB PPDU at the STA’s maximum transmit power for the assigned UL MCS.NOTE—The expected receive signal power is then the STA's maximum transmit power for the assigned UL MCS minus the path loss. |

NOTE—It is possible that a STA is unable to transmit the TB PPDU at a transmit power that will meet the expected receive signal power due to its hardware or regulatory limitation (see 27.3.15.2 (Power pre-correction) for an HE TB PPDU and 36.3.16.2 (Power pre-correction) for an EHT TB PPDU).

When carried in an HE PPDU, the UL MCS subfield indicates the HE-MCS, in the range HE MCS 0 to 3, to be used by the receiving STA for the HE TB PPDU is set to the HE-MCS index (see 27.5 (Parameters for HE-MCSs)). When carried in an EHT MU PPDU, the UL MCS subfield indicates the EHT-MCS to be used by the receiving STA for the EHT TB PPDU, and it is set to 0 for EHT-MCS 0, it is set to 1 for EHT-MCS 1, it is set to 2 for EHT-MCS 3, it is set to 3 for EHT-MCS 15.

* + - * 1. **EHT MAC Capabilities Information field(#1126)**

The format of the EHT MAC Capabilities Information field is defined in [Figure 9-1002s (EHT MAC Capabilities Information field format(#4918)(#6630)(#2920)(#1977))](#bookmark145).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 | B5 | B6 B7 | B8 | B9 B15 |
|  | NSEPPriority Access Supported | EHT OMControl Support | Triggered TXOPSharing Mode 1 Support | Triggered TXOPSharing Mode 2 Support | Restricted TWTSupport | SCS Traffic Description Support | Maximum MPDULength | EHT TRS Support | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 7 |

**Figure 9-1002s—EHT MAC Capabilities Information field format(#4918)(#6630)(#2920)(#1977)**

The subfields of the EHT MAC Capabilities Information field are defined in [Table 9-401i (Subfields of the](#bookmark146) [EHT MAC Capabilities Information field)](#bookmark146).

**Table 9-401i—Subfields of the EHT MAC Capabilities Information field**

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| …… | …… | …… |
| EHT TRS Support | For a non-AP STA, indicates support for transmitting an EHT TB PPDU after receiving a frame with a TRS Control subfield. | For a non-AP STA that has set the +HTC-HE Support subfield to 1:Set to 1 if the STA supports transmitting an EHT TB PPDU after receiving a frame with a TRS Control subfield.Set to 0 otherwise.Reserved for an AP or if the +HTC-HE Support subfield is 0. |

* **HT Control field operation**

|  |
| --- |
| * **Conditions for including Control subfield variants**
 |
| **Control subfield variant** | **Condition** |
| TRS | The transmitting AP expects an HE TB PPDU that follows the TRS information as described in 26.5.2.2 (Rules for soliciting UL MU frames) and the recipient non-AP STA has set the TRS Support subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities elements it transmits to 1.The transmitting AP expects an EHT TB PPDU that follows the TRS information as described in 35.4.2.2 (Rules for soliciting UL MU frames) and the recipient non-AP STA has set the EHT TRS Support subfield in the EHT MAC Capabilities Information field in(#Ed) the EHT Capabilities elements it transmits to 1. (#24161) |

**36.3.13.3 Coding** **36.3.13.3.1 General**

The Data field shall be encoded using either BCC defined in [36.3.13.3.2 (BCC coding)](#bookmark185) or the LDPC code defined in [36.3.13.3.3 (LDPC coding)](#bookmark186). For an EHT MU PPDU, the coding type is selected by the Coding subfield in the User field of EHT-SIG, as defined in [36.3.12.8 (EHT-SIG)](#bookmark116). For an EHT TB PPDU, the coding type is selected by the UL FEC Coding Type subfield in User Info field in the soliciting Trigger frame, or the RU size indicated in RU Allocation subfield in the soliciting frame carrying a TRS Control subfield, as defined in 9.3.1.22 (Trigger frame format) and 35.4.2.3.3 (TXVECTOR parameters for EHT TB PPDU response toTRS Control subfield), respectively(#5489).

(#2642)When conducting BCC FEC encoding for an EHT PPDU, the number of encoders is always 1 per STA(#7242).

 **36.3.13.3.6 Encoding process for an EHT TB PPDU**

For an EHT TB PPDU sent in response to a Trigger frame, the AP indicates the UL Length, GI And EHT-LTF Type, Number Of EHT-LTF Symbols, Pre-FEC Padding Factor, LDPC Extra Symbol Segment, and PE Disambiguity fields in the Trigger frame. The common values *TPE* and *NSYM* are derived by non-AP STAs as shown in [Equation (36-92)](#bookmark263) and [Equation (36-93)](#bookmark264)(#8132), respectively. The AP shall set the LDPC Extra Symbol Segment field in the Common Info field of the Trigger frame to 1 if (#8134)the condition in

step d) of LDPC encoding process described in [36.3.13.3.5 (Encoding process for an EHT MU PPDU)](#bookmark188) is

met for at least one LDPC encoded user solicited by the AP for an EHT TB PPDU transmission.

NOTE—The AP might set the LDPC Extra Symbol Segment field to 1 regardless of the value derived from the calculations. The AP might select a value for the Pre-FEC Padding Factor field that differs from that derived from the calculations described in (#8134)[36.3.13.3.5 (Encoding process for an EHT MU PPDU)](#bookmark188).

For an EHT TB PPDU sent in response to a frame containing a TRS Control subfield, the parameters used to derive the common values *TPE* and *NSYM* are described in 35.4.2.3.3 (TXVECTOR parameters for EHT TB PPDU response toTRS Control subfield).

**Straw Poll: Do you support to incorporate the proposed draft text in this document 11-22/0202r3 to the next revision of TGbe Draft?**

**Result: Yes/No/Abstain**