IEEE P802.11
Wireless LANs

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| Resolution for CIDs in 27.5.3.3 |
| Date: September 6, 2018 |
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 Abstract

This submission proposes resolutions for comments received for TGax LB233 (9):

17142, 16753, 16754, 16475, 16064, 16755, 16347, 16016, 16668

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revised based on offline feedback

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

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

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

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| **CID** | **Commenter** | **Pg / Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 17142 | Zhou Lan | 286.06 | 27.5.3.3 | When a STA received a basic trigger that is aggregated in an AMPDU, if all the other MPDUs have bad FCS, how the STA should responde? Clarify the behavior in the spec. | as in the comment | **Reject**D3.0 already provides guidance for this scenario – please see 27.5.3.4 bullet starting on pg 290 line 21 when TID Agg Limit = 0 and bullet starting on line 39 when the TID Agg Limit > 0. |
| 16753 | Sigurd Schelstraete | 286.50 | 27.5.3.3 | "A STA shall transmit an HE TB PPDU a SIFS after a received PPDU, if all the following conditions are met". Add: "It shall not transmit an HE TB PPDU otherwise" | See comment | **Reject**The spec has provided clear rules as to when a STA shall send a TB PPDU. It is natural that if any of the conditions are not satisfied, a STA shall not send a TB PPDU. We will need to update several sections of the spec if we start adding such negative rules. |
| 16754 | Sigurd Schelstraete | 286.54 | 27.5.3.3 | "The User Info field in the Trigger frame (...)". "The" is not correct since the Trigger frame will contain multiple User Info fields. | Change "The User Infro field" to "A User Infor field" | **Revised**Agree with the comment**TGax editor, please make changes as shown in doc 11-18/1455r2** |
| 16475 | Ming Gan | 287.20 | 27.5.3.3 | There is no PE TXVECTOR paramet settting when the STA transmitting an HE TB PPDU in response to a Trigger frame | Please add the descrition for the PE TXVECTOR paramet settting to this paragraph | **Reject**There is no such TXVECTOR parameter (called PE). The DEFAULT\_PE\_DURATION parameter applies only to TRS case (in case the comment was referring to it). |
| 16064 | Mark RISON | 287.62 | 27.5.3.3 | "The MIDAMBLE\_PERIODICITY parameter is present if the Doppler subfield in the Common Info field of the Trigger frame is set to 1. If present, it is set to the value of the Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field of the Trigger frame." is broken since that subfield is set to 0-2 or 4-6 in that case, and includes both the number of HE-LTF symbols and the midamble periodicity | Change the cited text to "[...] is set to the value indicated by the Number Of HE-LTF Symbols AndMidamble Periodicity subfield of the Common Info field of the Trigger frame." | **Revised**Agree with the comment**TGax editor, please make changes as shown in doc 11-18/1455r2** |
| 16755 | Sigurd Schelstraete | 287.63 | 27.5.3.3 | "The MIDAMBLE\_PERIODICITY parameter (...) set to the value of the Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field of the Trigger frame". This subfield contains information on both HE-LTF and midamble. | Change to "set to the value of Midamble periodicity indicated by the Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field of the Trigger frame" | **Revised**Agree with the comment**TGax editor, please make changes as shown in doc 11-18/1455r2** |
| 16347 | Mark RISON | 288.34 | 27.5.3.3 | Some TXVECTOR parameters are missing in the TRS case (cf. the Trigger frame case) | Add to this list that STARTING\_STS\_NUM is 0, that TXPWR\_LEVEL\_INDEX is set as for the Trigger frame case | **Revised**Agree with the comment**TGax editor, please make changes as shown in doc 11-18/1455r2** |
| 16016 | Mark RISON | 288.56 | 27.5.3.3 | "CODING\_TYPE" is not in TXVECTOR | Change to "FEC\_CODING" | **Revised**Agree with the comment**TGax editor, please make changes as shown in doc 11-18/1455r2** |
| 16668 | Robert Stacey | 286.50 | 27.5.3.3 | This statement requires that a STA transmit an HE TB PPDU in response to a Trigger frame or RTS Control, however, there is insufficient implementation guidance on what the A-MPDU should contain if the STA has no frames pending. | Add a statement "A STA that transmits an HE TB PPDU shall include at least one MPDU in the A-MPU. If the STA has no frames pending or is unable to include pending frames because the allocated resource is insufficient, then the STA shall include a QoS Null frame with any TID and with Ack Policy field No Ack." Add an additional constraint on the AP to ensure that it always allocates enough space for a QoS Null frame. | **Revised**Agree with the commentAdded a paragraph in 27.5.3.2.1 to cover the rules on AP side (i.e., AP should ensure that it provides sufficient resource for STAs to send QoS Null). Further added paragraph in 27.5.3.3 to clarify the expected behavior on the STA side (i.e., STA shall send at least a QoS Null if the allocated resource in the TF is not sufficient to send the queued MPDU).**TGax editor, please make changes as shown in doc 11-18/1455r2** |
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* **STA behavior for UL MU operation**

***TGax Editor: Please update this section as shown below (includes adding sub-sections for clear separation of each case and moving the last paragraph of the section to the end of the first sub-section):***

**27.5.3.3.1 General**[#Ed]

A STA shall not send an HE TB PPDU unless it is explicitly triggered by an AP in one of the operation modes described in this subclause.

The inter-frame space between a PPDU that contains a Trigger frame or frame that includes a TRS Control subfield(#13136) (#11317)and the HE TB PPDU is a SIFS(#Ed).

(#11318)A STA shall not transmit an HE TB PPDU that is not an HE TB NDP feedback PPDU if(#13917) all the following conditions are satisfied:

* The STA is operating in an operating class for which the behavior limits set listed in Annex E includes the DFS\_50\_100\_Behavior (see Table E-1).
* The HE TB PPDU would be in response to one of the following:
* A Trigger frame containing a User Info field with AID12 subfield carrying the 12 LSBs of the AID of the STA.
* A frame addressed to the STA that includes a TRS Control subfield.(#13136)
* A Trigger frame allocating at least one RA-RU.
* The RU is a 26-tone RU.
* If the STA has received at least one Beacon frame within the past dot11ObssNbRuToleranceTime(#13970) from an AP with which the STA is not associated and the Beacon frame meets any of the following conditions:
* The Extended Capabilities element is not present.
* The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field(#13428) in the Extended Capabilities element is not present.
* The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field(#13428) in the Extended Capabilities element is 0.

A STA(#14259) may ignore a Trigger frame that contains one or more subfields in either the Common Info field or the User Info field addressed to the STA with values that(#13830) are not recognized or not supported by the STA. A STA(#14259) may ignore a TRS Control subfield(#13136)(#14137) in a frame addressed to the STA if the TRS Control subfield(#13136)(#14137) contains one or more subfields with values that are not recognized or not supported by the STA. A STA(#14259) shall update the intra-BSS NAV (see 27.2.4 (Updating two NAVs)) based on the duration information of the Trigger frame or frame containing TRS Control subfield(#13136)(#14137) even if it decides to ignore its content.

A STA shall transmit an HE TB PPDU a SIFS after a received PPDU, if all(#11319) the following conditions are met:(#11990)

* The received PPDU contains either a Trigger frame (that is not an MU-RTS variant) with a User Info field addressed to the STA, or an MPDU addressed to the STA that contains an TRS Control subfield(#13136)(#14137). [#16754]A User Info field in the Trigger frame is addressed to a STA if one of the following conditions are met:
* The AID12 subfield is equal to the 12 LSBs of the AID of the STA and the Trigger frame is sent by the AP with which the STA is associated with or by the AP corresponding to the transmitted BSSID if STA is associated with a nontransmitted BSSID and has indicated support for receiving Control frames with TA set to the transmitted BSSID by setting the Rx Control Frame To MultiBSS subfield to 1 in the HE Capabilities element that the STA transmits.(#13143)
* The AID12 subfield is 0, the STA supports the UL OFDMA-based random access procedure (see 27.5.5 (UL OFDMA-based random access (UORA))) and the Trigger frame is sent by the AP with which the STA is associated.(#13143)(18/360r2)
* The AID12 subfield is 2045, the STA supports the UL OFDMA-based random access procedure (see 27.5.5 (UL OFDMA-based random access (UORA))), and the STA is not associated with the AP.
* The CS Required subfield in the Trigger frame is 1 and the UL MU CS condition described in 27.5.3.5 (UL MU CS mechanism) indicates the medium is idle, or the CS Required subfield in a Trigger frame is 0 or the response was solicited by a frame containing TRS Control subfield.
* The UL MU Disable subfield is 0 and the UL MU Data Disable subfield is 0 in the most recent OM Control subfield (if any) sent by the STA to the AP or the UL MU Disable subfield is 0 and the UL MU Data Disable subfield is 1 in the most recent OM Control subfield (if any) sent by the STA to the AP and the frame that is being triggered is an acknowledgment (see 27.8.3 (Transmit operating mode (TOM) indication)).(#11319)(#14331)

 (18/367r1)A STA addressed by a User Info field in a Trigger frame (i.e., the AID12 subfield is equal to the 12 LSBs of the AID of the STA) may ignore the remainder of User Info fields in the Trigger frame.

[#Ed]

**27.5.3.3.2 TXVECTOR parameter values when solicited by a Trigger frame**[#Ed]

A STA(#14259) transmitting an HE TB PPDU in response to a Trigger frame shall set the TXVECTOR parameters as follows:

* The FORMAT parameter is set to HE\_TB.(#12602)
* The TRIGGER\_METHOD parameter is set to TRIGGER\_FRAME.
* The TXOP\_DURATION parameter is set as defined in 27.11.5 (TXOP\_DURATION).
* The BSS\_COLOR parameter is set as follows:
* If the Trigger frame was received in an HE PPDU, then set to the value of the RXVECTOR parameter BSS\_COLOR of the HE PPDU.
* If the Trigger frame was received in a non-HE PPDU, then set to the value of the active BSS color as defined in 27.11.4 (BSS\_COLOR).(#11730)
* The L\_LENGTH parameter is set to the value indicated by the UL Length subfield(#11372) in the Common Info field of the Trigger frame.
* The GI\_TYPE and HE\_LTF\_TYPE parameters are set to the value indicated by the GI and LTF Type subfield of the Common Info field of the Trigger frame.
* 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 User Info field and STBC field in the Common Info field of the Trigger frame.
* The CH\_BANDWIDTH parameter is set to the value of the UL BW field in the Common Info field of the Trigger frame.
* The HE\_LTF\_MODE parameter is set to the value indicated by the MU-MIMO LTF Mode subfield of the Common Info field of the Trigger frame.
* The NUM\_HE\_LTF parameter is set to the value indicated by the Number Of HE-LTF Symbols And Midamble Periodicity subfield(#12055) of the Common Info field of the Trigger frame.
* The STBC parameter is set to the value indicated by the STBC subfield of the Common Info field of the Trigger frame.
* The LDPC\_EXTRA\_SYMBOL parameter is set to the value indicated by the LDPC Extra Symbol Segment subfield of the Common Info field of the Trigger frame.
* The SPATIAL\_REUSE parameter is set to the value of the UL Spatial Reuse subfield(#11372) in the Common Info field of the eliciting Trigger frame.
* The DOPPLER parameter is set to the value of the Doppler subfield in the Common Info field of the Trigger frame.(#12055)
* The MIDAMBLE\_PERIODICITY parameter is present if the Doppler subfield in the Common Info field of the Trigger frame is set to 1. If present, it is set to the value [#16064, 16755]indicated by the Number Of HE-LTF Symbols And Midamble Periodicity subfield in the Common Info field of the Trigger frame.(#12056)
* The HE\_SIG\_A2\_RESERVED parameter is set to the value of the UL HE-SIG-A2 Reserved subfield(#11372) in the Common Info field of the Trigger frame.
* The MCS parameter is set to the value of the UL MCS subfield(#11372) in the User Info field of the Trigger frame.
* The DCM parameter is set to the value indicated by the UL DCM subfield(#11372) of the User Info field of the Trigger frame.
* The STARTING\_STS\_NUM parameter is set to the value of the Starting Spatial Stream subfield in the SS Allocation field in the User Info field of the Trigger frame.
* The FEC\_CODING parameter is set to the value indicated by the UL FEC Coding Type subfield(#11372) of the User Info field of the Trigger frame.
* The RU\_ALLOCATION parameter is set as follows:(18/360r2)
* 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.
* The TXPWR\_LEVEL\_INDEX parameter is set to a value based on the computed transmission power (see 28.3.14.2 (Power pre-correction)) for HE TB PPDU and [#Ed]the value of the AP Tx Power subfield in the Common Info field and the UL Target RSSI subfield(#11372) in the User Info field of the Trigger frame.(#12507)
* The HE\_TB\_PE\_DISAMBIGUITY parameter is set to the value indicated by the PE Disambiguity subfield in the UL Packet Extension subfield in the Common Info field in the Trigger frame.(#12051)

**27.5.3.3.3 TXVECTOR parameter values when solicited by TRS Control subfield**[#Ed]

(#11322)A STA transmitting an HE TB PPDU in response to a frame containing a TRS Control subfield(#13136)(#14137) shall set the TXVECTOR parameters as follows:

* The FORMAT parameter is set to HE\_TB(#12602)
* The TRIGGER\_METHOD parameter is set to TRS(#13136)
* The L\_LENGTH parameter is computed as described in Equation (28-11) using the TXTIME value defined by Equation (28-135) where *NSYM* is set to *FVAL* + 1, where *FVAL* is the value of the UL Data Symbols subfield of the TRS Control subfield(#13136)(#11101)
* The RU\_ALLOCATION and MCS parameters are set to the values of the RU Allocation and UL MCS subfields of the TRS Control subfield(#13136), respectively.
* The CH\_BANDWITDTH parameter is set to the value of the RXVECTOR parameter CH\_BANDWIDTH of the soliciting DL HE PPDU(18/741r3)
* The BSS\_COLOR and DCM parameters are set to the values of the RXVECTOR parameters BSS\_COLOR and DCM of the soliciting DL MU PPDU, respectively
* The DOPPLER parameter is set to 0 and the MIDAMBLE\_PERIODICITY parameter is absent(#12057)
* The NUM\_HE\_LTF parameter is set to 1(#12058)
* The STARTING\_STS\_NUM parameter is set to 0[#16347]
* The HE\_LTF\_MODE, STBC, and NUM\_STS parameters are set to 0
* The [#16016]FEC\_CODING parameter is set to 0 if the RU Allocation subfield indicates less than 484-tone RU; otherwise set to 1
* The LDPC\_EXTRA\_SYMBOL parameter is not present if the RU Allocation subfield indicates less than a 484-tone RU; otherwise set to 1
* The SPATIAL\_REUSE parameter is set to SRP\_AND\_NONSRG\_OBSS\_PD\_PROHIBITED
* The DEFAULT\_PE\_DURATION parameter is set to the default PE duration value for UL MU response scheduling, which is indicated by the AP in the Default PE Duration subfield of the HE Operation element it transmits and the pre-FEC padding factor is set to 4 (see 28.3.12 (Packet extension))
* The TXOP\_DURATION parameter is set as defined in 27.11.5 (TXOP\_DURATION)
* The HE\_SIG\_A2\_RESERVED parameter is set to 511 (all 1s)
* If the RXVECTOR parameters HE\_LTF\_TYPE and GI\_TYPE of HE MU PPDU carrying the frame with the TRS Control subfield(#13136)(#14137) are either 4xHE-LTF and 3u2s\_GI, respectively, or 2xHE-LTF and 1u6s\_GI, respectively, then the HE\_LTF\_TYPE and GI\_TYPE parameters are set to 4xHE-LTF and 3u2s\_GI, respectively. Otherwise, the HE\_LTF\_TYPE and GI\_TYPE parameters are set to 2xHE-LTF and 1u6s\_GI, respectively.(#14318)
* The TXPWR\_LEVEL\_INDEX parameter is set to a value based on the computed transmission power (see 28.3.14.2 (Power pre-correction)) for HE TB PPDU and the value of the DL Tx Power subfield of the TRS Control subfield and the UL Target RSSI subfield(#11372) of the TRS Control subfield.[#16347]

NOTE 1—An HE STA transmitting an HE TB PPDU in response to a frame carrying a TRS Control subfield considers both physical CS and virtual CS to be 0 (see 27.5.3.5 (UL MU CS mechanism)).(#11103)

**27.5.3.3.4 RA field setting of an HE TB PPDU**[#Ed]

The RA field of the frames sent in response to a MU-RTS Trigger frame is set as defined in 9.3.1.3 (CTS frame format). The RA field of the MPDUs sent in response of a GCR MU-BAR Trigger frame or MU-BAR Trigger frame is set as defined in 9.3.1.9 (BlockAck frame format). (#11320)The RA field of the QoS Null frames, QoS Data frames(#13189) and Management frames sent in response to a Trigger frame shall be set to the MAC address of the destination AP (see 9.3.2.1 (Format of Data frames) and 9.3.3.2 (Format of Management frames)). The RA field of a QoS Null frame or Action No Ack frame sent in response to a frame carrying TRS Control subfield shall be the MAC address of the destination AP (see 9.3.2.1 (Format of Data frames) and 9.3.3.2 (Format of Management frames)).(#11157)

NOTE—All MPDUs within an A-MPDU carried in an HE TB PPDU have the same RA (see 9.7.3 (A-MPDU contents)). The settings of the address fields of MPDUs within the A-MPDU depend on the type and subtype of the MPDU as defined in 9.3 (Format of individual frame types).

[#Ed]

[#16668]

* Rules for soliciting UL MU frames
* General

***TGax Editor: Please add a new paragraph at the end of this section as shown below:***

An AP that transmits a Trigger frame or a frame containing TRS Control subfield should allocate sufficient resources for an elicited STA to transmit the MPDUs that are being solicited by the AP.

* A-MPDU contents in an HE TB PPDU

***TGax Editor: Please add a new paragraph as the 3rd paragraph in this section as shown below:***

An HE STA that generates an HE TB PPDU in response to a Trigger frame or a frame containing TRS Control subfield shall attempt to include at least one MPDU unless the allocated resources are insufficient in which case the responding STA may send an A-MPDU with only A-MPDU delimiters in the HE TB PPDU.

* Frame filtering based on STA state

***TGax Editor: Please add a new bullet under Class 1 Data frames this section of baseline spec (802.11-2016 pg 1645) as shown below:***

The frame classes are defined as follows:

* Class 1 frames
1. Data frames
2. Data frames between IBSS STAs
3. Data frames between peers using DLS
4. Data frames within a PBSS
5. QoS Null