###  **IEEE P802.11Wireless LANs**

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| LB271 CR for CIDs on Trigger frame, puncturing and EDCA |
| Date: 2023-06-03 |
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**Abstract**

This submission proposes resolutions for the following CIDs for TGbe LB271:

* 15721,17016,15759,15901,16128,
* 15902,15502,15657,17325,15663,
* 15002,17812,16735,17813,16737,
* 17814,18301,17816,17817,16738,
* 18007,17234,18008,17025,17026

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Editorial update for the text in the resolution column. TBD: update the text based on inputs during the call

***TGbe editor: Please note Baseline is 11be D3.2, 11me D3.0***

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| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | Clause | Page | Comment | Proposed Change | Resolution |
| 15721 | Yapu Li | 9.3.1.22.3 | 178.30 | There is an extra parenthesis after the title. | Delete it | AcceptedTgbe editor, the resolution is the same as that for CID 17903, which has passed motion |
| 17016 | Mark RISON | 9.3.1.22.3 | 0.00 | Spurious ) in caption | Delete ) | AcceptedTgbe editor, the resolution is the same as that for CID 17903, which has passed motion |
| 15759 | Dong Guk Lim | 9.3.1.22.3 | 178.30 | Subtitle has a typo. Correct it. | Delete right bracket | AcceptedTgbe editor, the resolution is the same as that for CID 17903, which has passed motion |
| 15901 | Xiaofei Wang | 9.3.1.22.3 | 178.30 | extra "0" | remove ")" | AcceptedTgbe editor, the resolution is the same as that for CID 17903, which has passed motion |
| 16128 | Jian Yu | 9.3.1.22.3 | 178.30 | The tracked change of the deleted bracket should be removed | As in comment | AcceptedTgbe editor, the resolution is the same as that for CID 17903, which has passed motion |
| 15902 | Xiaofei Wang | 9.3.1.22.3 | 178.36 | this sentence is redundant and is just repeat of information already specified earlier. Please remove | remove the paragraph | Accepted |
| 15502 | Chaoming Luo | 9.3.1.22.3 | 184.26 | The paragraph should be moved to 9.3.1.22.4, since it talks about EHT variant but not HE variant. | Use the 11ax text "The Number Of Spatial Streams subfield indicates the number of spatial streams, and is set to the number of spatial streams minus 1." in this subclause.And move the commented text to 9.3.1.22.4. | RevisedAgree with the commenter in principle. The text needs to be moved to the subclause for EHT variant User Info field and the original text in 11ax should be used here.Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #15502 |
| 15657 | Geonjung Ko | 9.3.1.22.5 | 185.47 | It is unclear whether the AID12 subfield in the EHT variant User Info field can be set to the value indicating an unallocated RU (e.g. 2046).If the AID12 subfield setting follows Table 9-51, the current text on the AID12 subfield set to 2046 (p.g. 181, line 61) only mentions the HE variant User Info field case. For the case of the EHT variant User Info field, it needs to define the usage of the PS160 subfield. | Please clarify whether the value 2046 can be used for the EHT variant User Info field. However, when clarifying, we need to take into account if there is an implementation specific problem, since that value can be recognized by non-EHT HE STAs. For example, an OBSS non-EHT HE STA may misidentify the location of the unallocated RU if it is indicated by AID12 2046. | RevisedAgree with the commenter in principle that AID 2046 in an EHT variant User Info may confuse a legacy STA, which may not decode the RU allocation correctly. A simple solution is to disallow AID 2046 in an EHT variant User Info field. If an EHT STA wants to find out unallocated RUs, the STA can scan through the User Info list. This solution is already the achieved by the following spec text in D3.2P200: “The AID12 subfield of an EHT variant User Info field is encoded as defined in Table 9-45i (AID12 subfield encoding) and has a value between 1 and 2006.”Tgbe editor please implement changes as shown in 11-23/519r1 (https://mentor.ieee.org/802.11/dcn/23/11-23-0519-01) tagged 15656, which has passed motion. |
| 17325 | Alfred Asterjadhi | 10.23.2 | 353.38 | The introduction of "where" makes the sentence unreadable. I guess it is a typo. Please fix it. | As in comment. | RevisedAgree with the commenter in principle. We deleted the ghost “where” and moved the 11be text towards the end of the sentence as the text refers to “that AC”. Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #17325 |
| 15663 | Geonjung Ko | 10.23.2.2 | 353.58 | The current text related to an HE TB PPDU needs to be extended to cover EHT TB PPDU cases. Other bullets in this subclause as well. | Please make text changes to cover EHT TB PPDU cases. | RevisedAgree with the commenter in principle. We expanded the related text to cover EHT TB PPDU.Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #15663 |
| 15002 | Robert Stacey | 26.5.1.1 | 467.46 | Only the "change" instruction uses strikethrough (see P47). | Change instruction to 'Delete the 4th paragraph that begins "An AP shall not transmit and HE MU PPDU..." and remove the strikethrough text. Similarly for instructions at 467.52, 468.13, 469.17 | Accepted |
| 17812 | Yunbo Li | 35.2.2 | 477.58 | "MU-RTS trigger" -->"MU-RTS Trigger" | as in comment | Accepted |
| 16735 | Mark RISON | 35.2.2.1 | 478.13 | "shall not set theB54 in the Common Info field to 1." seems a bit odd for a bit | Change to "shall set B54 in the Common Info field to 0." Also change "the B55" to "B55" earlier on in the sentence | RevisedAgree with the commenter in principle. Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #16735 |
| 17813 | Yunbo Li | 35.2.2.1 | 478.23 | the sentence in L23 has same meaning of paragraph in L1. Both of them say that EHT variant User info field will be used in punctured frame. | do the modification, or only keep one of them. | RevisedAgree with the commenter in principle. We deleted the referred text.Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #17813 |
| 16737 | Mark RISON | 35.2.2.1 | 478.31 | "shall not puncture other subchannelsin addition to those indicated" is a bit odd | Change to "shall not puncture subchannelsother than those indicated" | RejectedThe existing text is correct and better. The “other than” part in suggested text may cause confusion about whether the AP can puncture a subset of subchannels indicated in the Disabled Subchannel Bitmap. As the current spec text allows the AP to puncture a subset of subchannels indicated in the Disabled Subchannel Bitmap due to dynamic bandwidth operations, the existing spec text looks clearer.  |
| 17814 | Yunbo Li | 35.2.2.1 | 478.32 | "other subchannels" -> "other 20MHz subchannels" | as in comment | Accepted |
| 18301 | kaiying Lu | 35.2.2.1 | 478.32 | Remove the whole sentence because dynamic puncturing is not supported anyway. | As in comment. | RejectedAs there is no definition of dynamic puncturing in the current spec text, the referred text provides clarity on the AP behavior.  |
| 17816 | Yunbo Li | 35.2.2.2 | 478.38 | 35.5.2.3 has the rule to distiguish HE variant User Info field and EHT variant User Info field, but doesn't has rule to determine whether a EHT STA is addressed | changes the sentence to below: a non-AP EHT STA that is addressed by a User Info field shall follow 35.5.2.3 to determine the User Info field is HE variant or EHT variant | RevisedThe text has been revised for clarity based on the comment.Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #17816 |
| 17817 | Yunbo Li | 35.2.2.2 | 478.42 | what's the reason that an EHT STA addressed by an HE variant User Info not follow 35.5.2.4 to determine the CS condition? Unify the same CS mechanism for EHT STA will simpify the implementation. | Like in next paragraph, add "except that UL MU CS condition shall be determined based on the rules defined in 35.5.2.4 (UL MU CS mechanism for EHT STAs)" at the end of this paragraph. | RejectedThe referred spec text is correct and simpler as a STA can simply reuses existing/legacy HE behaviors when the STA is identified in a legacy HE variant User Info field. |
| 16738 | Mark RISON | 35.2.2.2 | 478.49 | "except that UL MU CS condition" should be "except that the UL MU CS condition" | As it says in the comment | Accepted |
| 18007 | Yanjun Sun | 35.5.2.2.1 | 590.63 | As rules for HE MU PPDU is referred in this bullet, it looks that it's safer to clarify that the EHT MU PPDU in this bullet is not an EHT SU transmission, i.e. emphasizing the MU operation here. E.g. "EHT MU PPDU addressed to multiple STAs" | As in comment | RevisedAgree with the commenter in principle. Revised the text to exclude EHT SU transmission.Tgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #18007 |
| 17234 | Sigurd Schelstraete | 35.5.2.3.1 | 592.53 | "A non-AP EHT STA shall not send an HE TB PPDU on the secondary 160 MHz". This looks like a redundant requirement since "An EHT AP shall not trigger a non-AP EHT STA to send an HE TB PPDU that covers the secondary 160 MHz." (P590L50) | Consider removing this requirement or replacing with a note. | RevisedTgbe editor please implement changes as shown in doc 11-23/0969r1 tagged as #17234 |
| 18008 | Yanjun Sun | 35.5.2.3.1 | 593.28 | Insert a space before "where" | As in comment | Accepted Tgbe editor please implement changes as shown in 11-23/306r2 tagged 17019, which has passed motion. |
| 17025 | Mark RISON | 35.5.2.3.2 | 594.11 | "the EHT variant User Info field" -- it's necessarily EHT variant | Delete "EHT variant". Ditto at line 14 | RejectedAs this subclause is about EHT TB PPDU as a response, the corresponding User Info field has to be an EHT variant. |
| 17026 | Mark RISON | 35.5.2.3.2 | 0.00 | "of the Trigger frame" / "of the eliciting Trigger frame" -- either say everywhere or nowhere | Delete at lines 8, 14, 17, 24 | Accepted.Tgbe editor, please apply the suggested changes to the spec text at D3.0P594. as shown in doc 11-23/0969r1 tagged as #17026 |

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.***

***Tgbe editor: Please replace the paragraph in subclause 9.3.1.22.4 (at 11beD3.2P198L55) with the original baseline text (at 11meD3.0P669L36) as follows. (track change enabled)*** (#15502)***:***

**9.3.1.22.4 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 (see 26.5.2.3.3 (TXVECTOR parameters for HE TB PPDU response to Trigger frame)).

The Number Of Spatial Streams subfield indicates the number of spatial streams, and is set to the number of spatial streams minus 1.

***Tgbe editor: Please move the paragraph in subclause 9.3.1.22.4 (at 11beD3.2P198L63) to replace the paragraph in subclause 9.3.1.22.5 (at 11beD3.2P198L26) as follows. (track change enabled)*** (#15502)***:***

**9.3.1.22.5 EHT variant User Info field**

**… …**

(#15210)

The Number Of Spatial Streams subfield indicates the number of spatial streams, and is set to the number of spatial streams minus 1 with a maximum value of 3 (see 36.1.1 (Introduction to the EHT PHY)).

***Tgbe editor: Please update subclause 10.23.2.2 as follows. (track change enabled):***

* + - 1. **EDCA backoff procedure**

***Change the fourth paragraphs as follows:***

The backoff procedure shall be invoked by an EDCAF if any of the following events occurs:

* + - * 1. (#17325)An MA-UNITDATA.request primitive is received that causes an MPDU corresponding to the EDCAF’s AC to be queued for transmission or the transmit queues associated with that AC have become nonempty due to the conditions in 35.3.16.4 (Nonsimultaneous transmit and receive (NSTR) operation) such that all of the following are true:

one of the transmit queues associated with that AC has now become non-empty

any other transmit queues associated with that AC are empty

the backoff counter has a value of 0 for that AC

the medium is busy on the primary channel as indicated by any of the following:

physical CS

virtual CS

a nonzero TXNAV timer value

for a mesh STA that has dot11MCCAActivated true, a nonzero RAV timer value.

* + - * 1. For the EDCAF that is the TXOP holder, the transmission of the final PPDU transmitted by the TXOP holder during the TXOP has completed and the TXNAV timer has expired, the PPDU does not solicit a (#15663) TB PPDU.
				2. For the EDCAF that is the TXOP holder, the transmission of an MPDU in the initial PPDU of a TXOP fails, as defined in this subclause, the PPDU does not solicit a (#15663) TB PPDU.
				3. A transmission attempt by the EDCAF collides internally with another EDCAF of an AC that has higher priority, that is, two or more EDCAFs in the same STA are granted a TXOP at the same time.
				4. The transmission of at least one MPDU in the final PPDU transmitted by the TXOP holder during the TXOP for that AC has completed, the PPDU contains an MPDU that solicits a (#15663) TB PPDU and the TXNAV timer has expired.
				5. The transmission of all MPDUs in the initial PPDU of a TXOP fails, as defined in this subclause, and the PPDU contains an MPDU that solicits a (#15663) TB PPDU.
				6. If explicitly indicated, such as in 26.17.2.3.3 (Non-AP STA scanning behavior).
				7. If explicitly indicated as in 35.3.16.4 (Nonsimultaneous transmit and receive (NSTR) operation).

In addition, the backoff procedure may be invoked by an EDCAF if:

* + - * 1. For the EDCAF that is the TXOP holder, the transmission by the TXOP holder of an MPDU in a non-initial PPDU of a TXOP fails, as defined in this subclause, and an MPDU in the non-initial PPDU does not solicit a (#15663) TB PPDU.
				2. The transmission by the TXOP holder of all ~~MPDUS~~MPDUs in a non-initial PPDU of a TXOP fails, as defined in this subclause, and the PPDU contains an MPDU that solicits a (#15663) TB PPDU.

***Tgbe editor: Please update subclause 35.2.2 as follows. (track change enabled):***

* + 1. **MU-RTS** (#17812)**Trigger/CTS frame exchange procedure for EHT STAs**
			1. **MU-RTS Trigger frame transmission**

An EHT AP shall follow the rules defined in 26.2.6.2 (MU-RTS Trigger frame transmission) and the following additional rules to transmit an MU-RTS Trigger frame.

If a non-AP EHT STA is addressed in an MU-RTS Trigger frame from an EHT AP and any of the following conditions is met, the User Info field addressed to an EHT STA in the MU-RTS Trigger frame shall be an EHT variant User Info field:

* The bandwidth of the EHT MU PPDU or non-HT duplicate PPDU carrying the MU-RTS Trigger frame is 320 MHz.
* The EHT MU PPDU or non-HT duplicate PPDU carrying the MU-RTS Trigger frame is punctured.

Otherwise, the EHT AP may decide whether the User Info field in the MU-RTS Trigger frame is an HE variant User Info field or an EHT variant User Info field.

(#16735)If B55 in the Common Info field is equal to 0 in an MU-RTS Trigger frame, an EHT AP shall set B54 in the Common Info field to 0.

NOTE—Refer to 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) on valid combinations of B54 and B55 in the Common Info field, B39 in the User Info field, and User Info field variant.

An MU-RTS Trigger frame shall not solicit a CTS frame from an HE STA within a bandwidth that is indicated by UL BW field in the Common Info field of the MU-RTS Trigger frame and that contains any punctured 20 MHz subchannel. (#17813)

An MU-RTS Trigger frame may be carried in an EHT MU PPDU if all intended recipients are non-AP EHT STAs. If the MU-RTS Trigger frame is carried in an EHT MU PPDU, then the EHT AP shall set the TXVECTOR parameter EHT\_PPDU\_TYPE of the EHT MU PPDU to 1.

An EHT AP that transmits a PPDU carrying an MU-RTS Trigger frame shall not puncture other (#17814)20 MHz subchannels in addition to those indicated in the Disabled Subchannel Bitmap subfield in the EHT Operation element.

* + - 1. **CTS frame response to an MU-RTS Trigger frame**

(#17816)A non-AP EHT STA identified in a User Info field in an MU-RTS Trigger frame shall follow the rules defined in [35.5.2.3 (Non-AP STA behavior for UL MU](#bookmark123) [operation)](#bookmark123) to determine whether the User Info field is an HE variant User Info field or an EHT variant User Info field.

If an EHT STA is addressed by an HE variant User Info field in an MU-RTS Trigger frame, the EHT STA shall follow the rules defined in 26.2.6 (MU-RTS Trigger/CTS frame exchange procedure) in transmitting a response.

If the EHT STA is addressed by an EHT variant User Info field in the MU-RTS Trigger frame, the EHT STA shall follow the rules defined in 26.2.6 (MU-RTS Trigger/CTS frame exchange procedure) in transmitting a response, except that (#16738)the UL MU CS condition shall be determined based on the rules defined in [35.5.2.4 (UL](#bookmark127) [MU CS mechanism for EHT STAs)](#bookmark127). The CTS frame in response to the MU-RTS Trigger frame shall be sent in the RU indicated by the EHT variant User Info field, excluding any punctured 20 MHz subchannel indicated in the Disabled Subchannel Bitmap subfield in the EHT Operation element.

***Tgbe editor: Please update subclause 35.5.2.2 as follows. (track change enabled):***

* + - 1. **Rules for soliciting UL MU frames**
				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 (#18007)PPDUs that are not in an EHT SU transmission and EHT TB PPDUs, respectively.

***Tgbe editor: Please update subclause 35.5.2.3 as follows. (track change enabled):***

* + - 1. **Non-AP STA behavior for UL MU operation**
				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 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 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 that is not MU-RTS Trigger frame in which the AID12 subfield matches its AID, then the STA shall respond with an HE TB PPDU.

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

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).

(#17234)

* + - * 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 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 (#17026).

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.

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(#17026).

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 (#17026).

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 (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 (#17026).

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.

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.