IEEE P802.11  
Wireless LANs

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| Comment resolutions for miscellaneous CIDs for SA2 | | | | |
| Date: 2020-10-01 | | | | |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D7.0 with the following CIDs (19 CIDs):

* First round:
  + 25015, 25018, 25035, 25046, 25049, 25063, 25066, 25094, 25121, 25127,
  + 25128, 25130, 25131, 25088,
* Second round:
  + 25089, 25090, 25126, 25129, 25068

Revisions:

1. Rev 0: Initial version of the document.
2. Rev 1: Incorporated changes suggested by Mark and added another resolution for CID 25088. Changes highlighted in green.
3. Rev 2: Addressed comments received during the presentation of the CIDs. Changes still highlighted in green.
4. Rev 3-4: Updated resolution to 25126 as per received feedback, and added 25068 which was reassigned to me and has same resolution as 25126. Also proposed resolutions to CIDs 25089 and 25090 which were transferred from Abhishek. Lastly it provides another resolution option for CID 25129. These resolutions are under the second round category.

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** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 25015 | Myles, Andrew | 484.48 | On behalf of Pooya Monajemi      Unsolicited broadcast Probe Response frame must be scheduled only when and if FILS Discovery frame is omitted. Sentence suggests that UPR must be scheduled whenever the dot11UnsolicitedProbeResponseOptionActivated is false. | Reword to : "If dot11UnsolicitedProbeResponseOptionActivated is false, then a FILS Discovery frame may be   omitted, in which case an unsolicited broadcast Probe Response frame shall be scheduled …" | Revised –  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25015. |
| 25018 | Myles, Andrew | 485.23 | On behalf of Pooya Monajemi  With knowledge of a probing STA's expected channel dwell duration, an AP can know if the STA is expected to be on channel until the next beacon or unsolicited probe response. | Mandate that 6GHz probe requests include MaxChannelTime (included in FILS parameter set) | Rejected –  The comment is out of scope: i.e., it is not on changed text, text affected by changed text or text that is the target of an existing valid unsatisfied comment. |
| 25035 | Seok, Yongho | 486.15 | In 6 GHz, the STA can't transmit any Probe Request frame on a channel before the STA receives a frame from an AP operating on that channel. (See the below FCC rule)   "In the 5.925-7.125 GHz band, client devices must operate under the control of a standard power access point, indoor access point or subordinate access point; Subordinate access points must  operate under the control of an indoor access point. In all cases, an exception exists for transmitting brief messages to an access point when attempting to join its network after detecting a signal that confirms that  an access point is operating on a particular channel...." | Please update the 26.17.2.3.3 according to the regulation requirement. | Rejected –  The comment fails to identify a technical issue. IEEE802.11 standard applies world-wide and is not tied to specific local regulatory requirements when it comes to technical specification. However, it is worth noting that an 802.11 compliant device will obey not only IEEE802.11 requirements but also the local regulatory requirements (e.g., those of FCC in the U.S.). |
| 25046 | Seok, Yongho | 432.51 | The comment requested by a non-member of this TGax SA Ballot (Young-hoon Kwon).   What is a "TBTT scheduled STA"? Definition needed. | As shown in the comment. | Revised –  Agree in principle with the comment. Proposed resolution adds the definition for the TBTT scheduled STA and also for the TBTT scheduling AP in clause 3.2.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25046. |
| 25049 | RISON, Mark | 382.27 | “— A UPH Control subfield is not included in any frame if the remaining space in the A-MPDU, after inclusion of solicited frames that cannot contain an HE variant HT Control field, is not sufficient to contain frame(s) that contain an HE variant HT Control field.” is not clear as to what “inclusion of solicited frames” means, specifically whether they have to frames that are required to be included in the response or merely frames that are allowed to be included in the response. Also, it would be clearer to say "… is not sufficient to contain a frame that contains…" to make it clear that if you can include a single frame with the HEvHTC you must do so, even if that means you then cannot squeeze in a second frame that could carry an HEvHTC | Change to "— A UPH Control subfield is not included in any frame if the remaining space in the A-MPDU, after inclusion of frames that can be in included in the A-MPDU but cannot contain an HE variant HT Control field, is not sufficient to contain a frame that can be included in the A-MPDU and can contain an HE variant HT Control field" | Revised –  Agree in principle with the changes. Proposed resolution is inline with the proposed changes, except for some editorial modifications/improvements.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25049. |
| 25063 | RISON, Mark | 416.30 | "The TWT  responding STA should solicit buffer status reports from the TWT requesting STA at the start of the TWT  SP following the procedure described in 26.5.3 (MU cascading sequence) or as described in 26.5.7 (NDP  feedback report procedure)." -- the xrefs look bogus | As it says in the comment | Revised –  Agree in principle with the commnet. Something went wrong between D4.0 and D5.0. Proposed resolution is to fix the first reference, which should be referring to buffer status report operation.  TGax Editor: please check what has happened and ensure that it hasn’t happened elsewhere too.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25063. |
| 25066 | RISON, Mark | 382.31 | "A UPH Control subfield is not included in a frame if the other Control subfields in the HE variant HT  Control field and the available space in the HE variant HT Control field, other than Control subfields  with a Control ID subfield equal to 15, are included in the HE variant HT Control field of the frame,  is not sufficient to contain an additional UPH Control subfield as well." is very confusing | Change to "A UPH Control subfield is not included in a frame if the frame contains Control subfields other than UPH and ONES Control subfields in the HE variant HT  Control field and the remaining space   is not sufficient to contain an UPH Control subfield as well." At 277.20 change "An HE STA that receives a Control subfield with Control ID subfield equal to 15" to "An HE STA that receives a Control subfield with Control ID subfield equal to 15 (an ONES Control subfield)". At 382.39 change "a Control subfield with a Control ID subfield set to 15" to "an ONES Control subfield" | Revised –  Agree in principle with the changes. Proposed resolution is inline with the proposed changes, except for some editorial modifications/improvements.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25066. |
| 25094 | RISON, Mark | 380.62 | "A non-AP STA shall follow the rules in 26.5.4.5 (Additional considerations for unassociated STAs) to con-  struct an HE TB PPDU in response to a Trigger frame that is not an MU-RTS Trigger frame from an AP  with which it is not associated and that allocates RA-RUs for unassociated STAs." appears on the previous page | Delete the cited text on the referenced page | Accepted |
| 25121 | RISON, Mark | 466.47 | "If the OPS AP sets the bit corresponding to an OPS  non-AP STA in the traffic indication virtual bitmap field carried by the Partial Virtual Bitmap of the TIM  element of the OPS frame or FILS Discovery frame to 0, the AP should send neither individually addressed  frames to the STA nor Trigger frames with a User Info field that addresses the STA during the OPS period." -- a non-AP STA needs to be able to rely on the OPS AP not addressing the STA during the OPS period, else the STA is at risk of losing DL data. I have to keep resubmitting the comment because it is not being addressed, it is being evaded. As https://mentor.ieee.org/802.11/dcn/20/11-20-0227-04-000m-pifs-for-beacons.pptx says, "It seems this commented was "punted" without a proper consideration.  This is not allowed under IEEE-SA processes". | Change "should" to "shall" in the cited text | Rejected –  A substantially similar comment was rejected in the previous round with the following argument:  “the problem raised here is not an issue. The STA has sufficient confidence that it can go to doze state without the proposed change, without taking the risk of loosing DL data.”  The CRC had discussed the comment and concluded that the problem raised by the commenter was not an issue. Hence, it is not clear what is not being addressed or what is being “punted”.  Also please note that even if for some reason the AP does decide to trigger the STA or send DL BUs to the STA there is still no risk for the STA of losing data if it is in doze state because in the first case the STA would simply not respond to the Trigger frame addressed to it (which has similar impact to not receiving the Trigger frame) while in the second case the AP would not receive an acknowledgment frame from the STA (since the sta is in doze state) and hence enter recovery mode. |
| 25127 | Kandala, Srinivas | 474.35 | Wording for the condition when HE ER SU PPDU should be used for control frame in responding to other frames is unclear. In the following content "A Control frame sent by an HE STA as a response to an HE SU PPDU or a non-HT PPDU that does not contain a Trigger frame or frame carrying a TRS Control field should be carried in a non-HT PPDU unless the most recently received PPDU sent by a recipient of the HE SU PPDU to the HE STA after association was an HE ER SU PPDU in which case the Control frame should be carried in an HE ER SU PPDU.", it is not clear what the following reference "the most recently received PPDU", " a recipient of the HE SU PPDU" and " the HE STA" are referring to. | Change the cited sentence to, "A Control frame sent by an HE STA as a response to an HE SU PPDU or a non-HT PPDU that does not contain a Trigger frame or frame carrying a TRS Control field should be carried in a non-HT  PPDU unless the most recent PPDU sent by the HE STA to the recipient(s) of the control frame after association was an HE ER SU PPDU in which case the Control frame should be carried in an HE ER SU PPDU." | Revised –  The CRC finds that the cited sentence is located in P469L30.  Agree in principle with the changes. Proposed resolution accounts for all the proposed changes, except for some minor editorial changes (e.g., capital C rather than c for control frame).  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25127. |
| 25128 | Kandala, Srinivas | 474.35 | wording for the condition when HE ER SU PPDU should not be used for control frame in responding to HE ER SU frame is unclear. In the following content " A Control frame sent by an HE STA as a response to an HE ER SU PPDU that does not contain a Trigger frame or frame carrying a TRS Control field should be carried in an HE ER SU PPDU unless the most recently received PPDU sent by a recipient of the HE ER SU PPDU to the HE STA after association was not an HE ER SU PPDU in which case the Control frame should be carried in non-HT PPDU.", it is not clear what the following reference "the most recently received PPDU", " a recipient of the HE ER SU PPDU" and " the HE STA" are referring to. | " A Control frame sent by an HE STA as a response to an HE ER SU PPDU that does not contain a Trigger frame or frame carrying a TRS Control field should be carried in an HE ER SU PPDU unless the most recent PPDU sent this HE STA to the recipient(s) of the control frame after association was not an HE ER SU PPDU in which case the Control frame should be carried in non-HT PPDU " | Revised –  The CRC finds that the cited sentence is located in P469L24.  Agree in principle with the changes. Proposed resolution accounts for all the proposed changes, except for some minor editorial changes (e.g., capital C rather than c for control frame).  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25128. |
| 25130 | Hamilton, Mark | 478.42 | Follow-up to CID 24543. The potential for adding complexity to list the features that are not applicable is much smaller than the complexity for an implementer of the ax amendment to have to check all of clauses 26 and 27 for any exceptions, especially if those are not always indicated as exceptions but are just a statement of new behavior. As an alternative to listing here what the exceptions are, it would be very helpful to the reader to at least have a NOTE in the earlier clauses where a feature that is (or might be?) impacted by clause 26 or 27 "overrides". | For the major feature (sub)clauses that have a known or potential change (or are "not applicable") for 6 GHz operation, add a NOTE in the main body text (earlier clauses) that indicates "This feature [has | may have] changes when operating in 6 GHz, see clause [26 | 27]. | Rejected –  The comment fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined.  The commenter is invited to submit detailed changes that would satisfy the comment. |
| 25131 | Hamilton, Mark | 483.63 | Follow-up to CID 24546. The added sentence helps considerably. However, normative verbs are missing or misused. | Change to "A 6 GHz STA \_shall\_ perform \_the\_ subset of the operations defined for a FILS STA \_\_ described in 26.17.2.3 (Scanning  in the 6 GHz band) and \_may\_ perform all the other operations defined for a FILS STA." | Revised –  Agree in principle with the changes. Proposed resolution accounts for all the proposed changes with the additional clarification that this subset of operations is the one that is described in 26.17.2.3 (editorial).  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25131. |
| 25088 | RISON, Mark | 276.6 | "The transmitting STA includes an A-Control subfield that  contains a Control subfield with Control ID subfield equal  to 15 and Control Information subfield equal to all 1s and  whose content is ignored by the HE recipient STA." -- should be a "shall be" not a "is" to make it normative, but anyway the style of this entry does not match all the others | Change to "The transmitting STA includes an A-Control subfield that  contains a Control subfield with Control ID subfield equal  to 15 and Control Information subfield equal to all 1s. The recipient STA shall ignore this Control subfield." | Revised –  Agree in principle with the commenter, but we already have the normative behavior specified in clause 10.8. Proposed resolution is to clarify certain paragraphs to make the normative and declarative statements consistent throughout the draft for this field.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-02-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25088. |
| **Second Round** | | | | | |
| 25089 | RISON, Mark | 372.48 | "The other remaining subfields are set to any valid value" -- this must be true, because by definition a compliant IEEE Std 802.11 STA shall not set subfields to invalid values | Delete the cited text | Revised –  Agree in principle with the comment. A similar comment submitted in the previous ballot and withdrawn to make progress was pointing out something similar, however, also indicating that it is not specific field value that is important but the resulting HE TB PPDU that is sent in response to this frame. That comment also was part of a No vote. Hence, proposed resolution is to address the issue raised here and preventing any other issues that would arise by removing this sentence. Quoting the other comment (which was withdrawn):  **Comment 24552:** "The other remaining subfields are set to any valid value" This is not clear. I guess you want to say a valid value so that the soliciting STA constructs a valid HE TB PPDU.  **Proposed Change:** Ensure that the AP provides valid combinations of the values so that the STA constructs a valid HE TB PPDU.  Please note that a valid HE TB PPDU here refers to a correctly constructed HE TB PPDU. For example, a valid HE TB PPDU is one that contains enough number of data bits per symbol and enough NSYMs  to be able to include in the HE TB a correctly formed A-MPDU.    TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-04-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25089. |
| 25090 | RISON, Mark | 372.48 | "The other remaining subfields are set to any valid value" -- no specification of "valid value" is provided. Either other parts of the specification give this, in which case this statement is duplication, or they don't, in which case this statement  is not specific enough. In either case it's useless | Delete the cited text | Revised –  Agree in principle with the comment. A similar comment submitted in the previous ballot and withdrawn to make progress was pointing out something similar, however, also indicating that it is not specific field value that is important but the resulting HE TB PPDU that is sent in response to this frame. That comment also was part of a No vote. Hence, proposed resolution is to address the issue raised here and preventing any other issues that would arise by removing this sentence. Quoting the other comment (which was withdrawn):  **Comment 24552:** "The other remaining subfields are set to any valid value" This is not clear. I guess you want to say a valid value so that the soliciting STA constructs a valid HE TB PPDU.  **Proposed Change:** Ensure that the AP provides valid combinations of the values so that the STA constructs a valid HE TB PPDU.  Please note that a valid HE TB PPDU here refers to a correctly constructed HE TB PPDU. For example, a valid HE TB PPDU is one that contains enough number of data bits per symbol and enough NSYMs  to be able to include in the HE TB a correctly formed A-MPDU.    TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-04-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25090. |
| 25126 | Kandala, Srinivas | 474.35 | RE: CID #24170. I understand the resolution to the comment. However, it brought a few more comments which I am covering in this comment and the next 3:  “Trigger frame or frame carrying a TRS Control field” is same as "triggering frame" | Replace the cited text with "Triggering frame" | Revised –  The CRC finds that the cited issue is located in P469L24 and L31.  Agree in principle with the changes (except that proposed change is to use triggering frame rather than Triggering frame). In addition, a thorough search was performed to accommodate the same change throughout for consistency.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-04-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25126. |
| 25129 | Kandala, Srinivas | 474.35 | : the term “after association” in this two paragraphs make the format selection prior to association has unbalanced link. Please see contribution 802.11-20/1503 for detailed discussion. | two options: Opt 1: Remove the term “after association” in the restrictions. Opt 2: Add the following :  “Prior to association, a control frame sent by an HE STA should be carried in an HE ER SU PPDU in any of these two scenarios: 1. it is a response to an HE ER SU PPDU that does not contain a triggering frame, unless the most recent PPDU sent by this HE STA to the recipient(s) of this control frame was not an HE ER SU PPDU 2. the most recent PPDU sent by this HE STA was an HE ER SU PPDU.” | Rejected –  It is also worth noting that the particular functionality of being able to switch PPDU format after association (between non-HT PPDU and HE ER SU PPDU) for control response frames has been part of the TGax draft since TGax D1.0. Prior to association the baseline “rules defined in 10.6.6 (Rate selection for Control  frames)” shall be followed, unless any of the exemptions in the subclause under discussion apply (and there is no exemptions for the case of prior to association).  There are several reasons why the use of HE ER SU PPDUs are not allowed prior to association for control response frames:   1. A STA does not transmit a Control frame in an HE ER SU PPDU to a receiving STA unless the receiving STA indicates that HE ER SU PPDU reception is enabled. Tracking the state of which STA has enabled this functionality is done after association as specified in this subclause. This way the recipient STA can correctly set the NAV in the frame that would be soliciting the control response frame carried in ER SU PPDU. 2. They are not decodable by legacy STAs, and the reception of their preambles causes legacy STAs to enter EIFS-recovery, penalizing legacy STAs contention.   For the particular case of link imbalance prior to association the TGax draft has defined a Trigger frame for random access that better solves the issue at hand and actually provides larger range since the UL RUs can be as narrow as 26 tones RUs, while this is not the case for ER SU PPDUs which are limited to (default 242-tone RU) and optionally in RX can go to 106-tone RU).  It is also noteworthy to point out the extensive discussions that the TGax group has had on the ER SU PPDU format in general and the outcome of those discussions as reflected in the document cited below: <https://mentor.ieee.org/802.11/dcn/18/11-18-0012-03-00ax-lb230-mac-cr-27-15-2.docx> |
| 25068 | RISON, Mark |  | "Trigger frame or frame containing a TRS Control subfield" should be just "triggering frame" | Change at 370.25, 370.28, 371.21, 376.48 | Revised –  Agree in principle with the changes. In addition, a thorough search was performed to accommodate the same change throughout for consistency.  TGax editor to make the changes shown in <https://mentor.ieee.org/802.11/dcn/20/11-20-1541-04-00ax-mac-cr-miscellaneous-cids-for-sa2.docx>  under all headings that include CID 25068. |

**Discussion: *None.***

# FIRST ROUND

* AP behavior for fast passive scanning

**…**

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 25015):***

* If dot11UnsolicitedProbeResponseOptionActivated is true, all FILS Discovery frames shall be omitted and an unsolicited broadcast Probe Response frame shall be scheduled for transmission at the target transmit time instead of each omitted*(#25015)* FILS Discovery frame.
* If dot11UnsolicitedProbeResponseOptionActivated is false, then any FILS Discovery frame may be omitted and an unsolicited broadcast Probe Response frame shall be scheduled for transmission at the target transmit time instead of each omitted*(#25015)* FILS Discovery frame.

… (#24209)

**26.8.2 Individual TWT agreements**

**…**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25063):***

The TWT responding STA of a trigger-enabled TWT agreement shall schedule for transmission a Trigger frame for the TWT requesting STA, as described in 26.5.2 (UL MU operation), within each TWT SP for that TWT agreement except that the Trigger frame may be replaced by a frame carrying a TRS Control subfield provided that the frame is carried in a DL MU PPDU and the AP allocates enough resources in the HE TB PPDU for the STA to at least deliver its BSRs in response to the soliciting DL MU PPDU. The TWT responding STA should solicit buffer status reports from the TWT requesting STA at the start of the TWT SP following the procedure described in 26.5.5 (Buffer status report operation)*(#25063)* or as described in 26.5.7 (NDP feedback report procedure). The TWT responding STA that intends to schedule for transmission additional Trigger frames during a trigger-enabled TWT SP shall set the More TF subfield in the Common Info field of the Trigger frame to 1 to indicate that it will schedule for transmission another Trigger frame within the same TWT SP. The TWT responding STA shall set the More TF subfield to 0 when the Trigger frame is the last scheduled Trigger frame of the TWT SP or when the Trigger frame is scheduled for transmission outside of a TWT SP.

…

**3.2 Definitions specific to IEEE 802.11**

**TGax Editor: *Insert the definition below in the appropriate location (maintaining alphabetical order) (#CID 25046):***

**target beacon transmission time (TBTT) scheduled station (STA):** A non-access-point (non-AP) STA that has negotiated the TBTT of the first Beacon frame and the wake interval between subsequent Beacon frames that it intends to receive.*(#25046)*

**target beacon transmission time (TBTT) scheduling access point (AP):** An AP that has negotiated with a non-AP station (STA) the TBTT of the first Beacon frame and the wake interval between subsequent Beacon frames that the non-AP STA intends to receive.*(#25046)*

**26.5.2.4 A-MPDU contents in an HE TB PPDU**

…

A non-AP STA shall include an HE variant HT Control field containing the UPH Control subfield in the frames carried in the A-MPDU of the HE TB PPDU with the following exceptions:

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25049):***

— A UPH Control subfield is not included in any frame if the remaining space in the A-MPDU, after inclusion of solicited frames that are required to be included in the A-MPDU but cannot contain an HE variant HT Control field, is not sufficient to contain a frame that can be included in the A-MPDU and can contain an HE variant HT Control field.*(#25049)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25066):***

— A UPH Control subfield is not included in a frame if the frame contains Control subfields other than UPH Control and ONES Control subfields and the remaining space in the HE variant HT Control field of the frameis not sufficient to contain a UPH Control subfield as well.*(#25066)*

— A UPH Control subfield is not included in a frame that is a Control frame.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25066):***

A non-AP STA shall not include a ONES Control subfield in the HE variant HT Control field of the frames carried in an HE TB PPDU. *(#25066)*

…

**10.8 HT Control field operation**

…

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25066):***

An HE STA that receives a ONES Control subfield *(#25066)* shall ignore the remainder of the A-Control subfield.

…

* PPDU format selection

…

An HE STA shall send Control frames following the rules defined in 10.6.6 (Rate selection for Control frames) with the following exceptions:

* …

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25128):***

* A Control frame sent by an HE STA as a response to an HE ER SU PPDU that does not contain a triggering frame*(#25126)* should be carried in an HE ER SU PPDU unless the most recent PPDU sent by the HE STA to the recipient of the Control frame, *(#25128)* after association, was not an HE ER SU PPDU in which case the Control frame should be carried in a non-HT PPDU.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25127):***

* A Control frame sent by an HE STA as a response to an HE SU PPDU or a non-HT PPDU that does not contain a triggering frame *(#25126)* should be carried in a non-HT PPDU unless the most recent PPDU sent by the HE STA to the recipient of the Control frame, *(#25127)* after association, was an HE ER SU PPDU in which case the Control frame should be carried in an HE ER SU PPDU.
* …
* Scanning in the 6 GHz band
* General

…

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25131):***

A 6 GHz STA shall perform the subset of the operations defined for a FILS STA that is described in 26.17.2.3 (Scanning in the 6 GHz band) and may perform all the other operations defined for a FILS STA.*(#25131)* (#24546)

…

* HE variant

**TGax Editor: *Change the row below of this table as follows (#CID 25088):***

|  |  |  |
| --- | --- | --- |
| * Control ID subfield values | | |
| Meaning | Length of the Control Information subfield (bits) | Content of the Control Information subfield | |
| Triggered response scheduling (TRS) | 26 | See 9.2.4.6a.1 (TRS Control) | |
| Operating mode (OM) | 12 | See 9.2.4.6a.2 (OM Control) | |
| HE link adaptation (HLA) | 26 | See 9.2.4.6a.3 (HLA Control) | |
| Buffer status report (BSR) | 26 | See 9.2.4.6a.4 (BSR Control) | |
| UL power headroom (UPH) | 8 | See 9.2.4.6a.5 (UPH Control) | |
| Bandwidth query report (BQR) | 10 | See 9.2.4.6a.6 (BQR Control) | |
| Command and status (CAS) | 8 | See 9.2.4.6a.7 (CAS Control)) | |
| Reserved |  |  | |
| Ones need expansion surely (ONES) | 26 | Set to all 1s. *(#25088)* | |

* HT Control field operation

**TGax Editor: *Change the row below of this table as follows (#CID 25088):***

|  |  |
| --- | --- |
| * 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.(#24161) |
| OM | The transmitting STA changes its operating mode, as described in 26.9 (Operating mode indication) and the recipient STA has set the OM Control Support subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities elements it transmits to 1. |
| HLA | The transmitting STA follows the HE link adaptation procedure, as described in 26.13 (Link adaptation using the HLA Control subfield) and the recipient STA has set the HE Link Adaptation Support subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities elements it transmits to a nonzero value. |
| BSR | The transmitting non-AP STA follows the corresponding buffer status report procedure, as described in 26.5.5 (Buffer status report operation)(#Ed) and the recipient AP has set the BSR Support subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities elements it transmits to 1.(#24161) |
| UPH | The transmitting non-AP STA(#24161) follows the UL MU operation procedure, as described in 26.5.2.3 (Non-AP STA behavior for UL MU operation). |
| BQR | The transmitting non-AP STA follows the bandwidth query report procedure, as described in 26.5.2 (UL MU operation) and the recipient AP has set the BQR Support subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities elements it transmits to 1.(#24161) |
| CAS | The transmitting STA follows either:   * The reverse direction protocol procedure described in 10.28 (Reverse Direction Protocol) and the recipient STA has set the RD Responder in(#Ed) the HT Extended Capabilities field in the HT Capabilities elements it transmits to 1, or * The PSR procedure described in 26.10.3 (PSR-based spatial reuse operation) and the recipient STA has set the SR Responder subfield of the HE MAC Capabilities Information field in(#Ed) the HE Capabilities elements it transmits to 1. |
| ONES | The transmitting STA may include a ONES Control subfield in an MPDU that is not carried in an HE TB PPDU ( see 26.5.2.4 (A-MPDU contents in an HE TB PPDU)). *(#25088)* |

# SECOND ROUND:

* PPDU format selection

…

An HE STA shall send Control frames following the rules defined in 10.6.6 (Rate selection for Control frames) with the following exceptions:

* …

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

* A Control frame sent by an HE STA as a response to an HE ER SU PPDU that does not contain a triggering frame*(#25126, 25068)* should be carried in an HE ER SU PPDU unless the most recently received PPDU sent by a recipient of the HE ER SU PPDU to the HE STA after association was not an HE ER SU PPDU in which case the Control frame should be carried in non-HT PPDU.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25127):***

* A Control frame sent by an HE STA as a response to an HE SU PPDU or a non-HT PPDU that does not contain a triggering frame *(#25126, 25068)* should be carried in a non-HT PPDU unless the most recently received PPDU sent by a recipient of the HE SU PPDU to the HE STA after association was an HE ER SU PPDU in which case the Control frame should be carried in an HE ER SU PPDU.
* …

**4.3.15a High efficiency (HE) STA**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

An HE AP sends a Trigger frame to initiate OFDMA or MU-MIMO transmissions in the uplink direction or a frame containing a TRS Control subfield to initiate OFDMA transmissions in the uplink direction. The frame initiating these transmissions in the upling direction is a triggering frame. The triggering frame identifies non-AP STAs participating in the UL MU transmissions and assigns RUs and/or spatial streams to these STAs. Multi-STA BlockAck frames can be used by the AP to acknowledge the frames transmitted by multiple non-AP STAs. The scheduling of these triggering frames can be set up between a non-AP STA and the AP using TWT operation to save power and reduce collisions. *(#25126, 25068)*

* Ack Policy Indicator subfield

**TGax Editor: *Change the table below of this subclause as follows (#CID 25126, 25068):***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * Ack policy | | | | |
| Ack policy | Bits in QoS Control field | | Other conditions | Meaning |
| Bit 5 | Bit 6 |
| No Explicit Acknowledgment | 0 | 1 | Bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) is equal to 1 and the frame is not carried in an HE MU PPDU, HE SU PPDU or HE ER SU PPDU that contains a frame that solicits a response in an HE TB PPDU | There might be a response frame to the frame that is received, but it is neither the Ack frame nor any Data frame of subtype +CF-Ack.  This ack policy is used for QoS CF-Poll and QoS CF-Ack +CF-Poll Data frames.  NOTE—Bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) indicates the absence of a Frame Body field in a QoS Data frame. ~~When~~ If equal to 1, the QoS Data frame contains no Frame Body field, and any response is generated in response to a QoS CF-Poll or QoS CF-Ack +CF-Poll frame, but does not signify an acknowledgment of data. |
| PSMP Ack | 0 | 1 | Bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) is equal to 0 and the frame is not carried in an HE MU PPDU, HE SU PPDU or HE ER SU PPDU that contains a frame that solicits a response in an HE TB PPDU | The acknowledgment for a frame indicating PSMP Ack when it appears in a PSMP downlink transmission time (PSMP-DTT) is to be received in a later PSMP uplink transmission time (PSMP-UTT).  The acknowledgment for a frame indicating PSMP Ack when it appears in a PSMP-UTT is to be received in a later PSMP-DTT.  See 10.31.2.7 (PSMP acknowledgment rules). |
| HETP Ack(#24057) | 0 | 1 | The frame is carried in an HE MU PPDU, HE SU PPDU or HE ER SU PPDU that contains a frame that solicits a response in an HE TB PPDU | The addressed recipient returns an Ack, Compressed BlockAck, or Multi-STA BlockAck frame carried in an HE TB PPDU a SIFS after the PPDU, subject to reception of a triggering frame in the PPDU, as defined in 10.3.2.13.2 (Acknowledgment procedure for DL MU PPDU in MU format) and 26.5.2 (UL MU operation). *(#25126, 25068)* |

**9.2.4.6a.2 OM Control**

**TGax Editor: *Change the paragraph below and the table of this subclause as follows (#CID 25126, 25068):***

The allowed UL MU operations and frame types that can be transmitted as a response to a triggering frame are determined by the UL MU Disable subfield, UL MU Data Disable subfield and the recipient's setting of the OM Control UL MU Data Disable RX Support subfield in the HE Capabilities element, as indicated in Table 9-24b (UL MU Disable and UL MU Data Disable subfields encoding). *(#25126, 25068)*

If the OM Control field is transmitted by an HE AP, then the UL MU Disable and UL MU Data Disable subfields are reserved.

|  |  |  |  |
| --- | --- | --- | --- |
| * UL MU Disable and UL MU Data Disable subfields encoding | | | |
| UL MU Disable subfield | UL MU Data Disable subfield | Interpretation by an AP that transmits a value of 0 in the OM Control UL MU Data Disable RX Support | Interpretation by an AP that transmits a value of 1 in the OM Control UL MU Data Disable RX Support |
| 0 | 0 | All trigger based UL MU transmissions are enabled by the STA as defined in 26.5.2 (UL MU operation). | All trigger based UL MU transmissions are enabled by the STA as defined in 26.5.2 (UL MU operation). |
| 0 | 1 | N/A | Trigger based UL MU Data frame transmissions in response to a Basic Trigger frame are suspended by the STA as defined in 26.9.3 (Transmit operating mode (TOM) indication).  Other trigger based UL MU transmissions remain enabled by the STA as defined in 26.9.3 (Transmit operating mode (TOM) indication). |
| 1 | 0 | All trigger based UL MU transmissions are suspended by the STA.  The STA will not respond to a received triggering frame. *(#25126, 25068)* | All trigger based UL MU transmissions are suspended by the STA.  The STA will not respond to a received triggering frame. *(#25126, 25068)* |
| 1 | 1 | Reserved | Reserved |

* TWT element

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

The Trigger field indicates whether or not the TWT SP indicated by the TWT element includes triggering frames as defined in 26.8 (TWT operation). The Trigger field is set to 1 to indicate that at least one triggering frame is transmitted during the TWT SP. The Trigger field is set to 0 otherwise. *(#25126, 25068)*

**26.5.1 HE DL MU operation**

**26.5.1.1 General**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

The AP shall follow the EDCA procedure defined in 10.23 (HCF) and the following additional rules:

— If at least one of the frame exchanges in HE DL MU operation requires an immediate response (i.e., the AP includes at least one triggering frame)*(#25126, 25068)* and if the AP receives an immediate response with at least one correct MPDU from at least one of the solicited STAs, the frame exchange is successful.

— If at least one of the frame exchanges in HE DL MU operation requires an immediate response (i.e., the AP includes at least one triggering frame)*(#25126, 25068)* and if the AP receives no immediate response, the frame exchange is not successful.

**26.5.2.2 Rules for soliciting UL MU frames**

**26.5.2.2.1 General**

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

An AP shall not transmit a triggering frame if all of the following conditions are satisfied:

— The AP 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 AP has received at least one Beacon frame from OBSS B within the past dot11ObssNbRuToleranceTime in the current operating channel in which any of the following are true:

* The Extended Capabilities element is not present.
* The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field in the Extended Capabilities element is not present.
* The OBSS Narrow Bandwidth RU In OFDMA Tolerance Support field in the Extended Capabilities element is 0.

— The triggering frame*(#25126, 25068)* allocates at least one 26-tone RU whose location in frequency overlaps with the operating bandwidth of the OBSS B.

**TGax Editor: *Change the heading and the paragraphs below of this subclause as follows (#CID 25126, 25068):***

* Padding for triggering frame*(#25126, 25068)*

An AP transmitting a PPDU that contains a BCC encoded triggering frame*(#25126, 25068)* soliciting a response from a non-AP STA shall ensure that the number of bits in the PSDU following the last bit of SCH is at least *LPAD,MAC* as defined in Equation (26-1), which is based on the *MinTrigProcTime* indicated by the non-AP STA (see Table 9-323a (Subfields of the HE MAC Capabilities Information field)), where

*SCH* is either:

* the User Info field addressed to the STA of the last or only Trigger frame, or
* the last TRS Control subfield in the PSDU.
* *LPAD,MAC* = *NDBPSmPAD*

where

*NDBPS* is defined in Table 17-4 (Modulation-dependent parameters) for a non-HT PPDU, Table 19-7 (Frequently used parameters) for an HT PPDU, Table 21-6 (Frequently used parameters) for a VHT PPDU and Table 27-15 (Frequently used parameters) for an HE PPDU. If the triggering frame*(#25126, 25068)* is carried in HE MU PPDU, *NDBPS* is replaced by *NDBPS,u* of the target user in Equation (26-1).

For a non-HT PPDU, HT PPDU and VHT PPDU:



For an HE PPDU:



**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

If a triggering frame*(#25126, 25068)* is LDPC encoded, then the transmitting AP ensures that *TTrigProc* meets the following requirements:

…

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

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

NOTE—A non-AP STA obtains the information required to prepare an HE TB PPDU explicitly and implicitly. Explicit information is obtained in the triggering frame*(#25126, 25068)* contained in the triggering PPDU(#24288). Implicit information is obtained in previously exchanged frames with the AP, e.g., in the BSS Color and the Default PE Duration subfields of the HE Operation element, or from default values specified in 26.5.2.3 (Non-AP STA behavior for UL MU operation).

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

An AP shall follow the RU restriction rules defined in 27.3.2.8 (RU restrictions for 20 MHz operation) when assigning an RU to a 20 MHz operating non-AP STA for a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz HE TB PPDU. An AP shall not set the RU Allocation subfield of the User Info field of a triggering frame*(#25126, 25068)* that is addressed to a non-AP STA to a value such that the RU allocated to the STA lies outside the channel in which the STA is operating (see 27.3.2.6 (Resource allocation for an HE TB PPDU), and 27.3.2.9 (80 MHz operating non-AP HE STAs)) or outside the SST subchannel (if applicable) in which the STA is operating (see 26.8.7 (HE subchannel selective transmission)).

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

An AP shall transmit an HE PPDU that carries a triggering frame*(#25126, 25068)* with the TXVECTOR parameter BEAM\_CHANGE set to 1.

* AP access procedures for UL MU operation

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

If an AP receives an immediate response with at least one frame from at least one non-AP STA solicited by a triggering frame*(#25126, 25068)*, the frame exchange is successful.

* General

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

The inter-frame space between a PPDU that contains a triggering frame*(#25126, 25068)* and the HE TB PPDU is a SIFS.

* Conditions for not responding with an HE TB PPDU

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

A non-AP STA may choose to not respond a TRS Control subfield in a frame addressed to the non-AP STA if the TRS Control subfield contains one or more subfields with values that are not recognized, not supported or cannot be satisfied by the non-AP STA. A non-AP STA shall update the intra-BSS NAV (see 26.2.4 (Updating two NAVs)) based on the duration information of the triggering frame*(#25126, 25068)* even if it decides to not respond to the frame.

* Transmit operating mode (TOM) indication

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

An OMI initiator that is a non-AP STA may indicate changes in its transmit parameters by sending a frame that contains the OM Control subfield to the OMI responder. The OMI initiator shall set:

* The UL MU Disable subfield to 1 to indicate suspension to response to a triggering frame (see 26.5.2 (UL MU operation).
* An AP that is an OMI initiator shall set the UL MU Disable subfield to 0.
* The Tx NSTS subfield to the maximum *NSTS* that the STA will use for an HE TB PPDU sent in response to a triggering frame*(#25126, 25068)*.
* The Channel Width subfield to the maximum operating channel width that the STA will use for an HE TB PPDU sent in response to a triggering frame*(#25126, 25068)*.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

The OMI responder shall indicate an RU allocation in the RU Allocation subfield of the User Info field of a triggering frame*(#25126, 25068)* addressed to the OMI initiator, that is within the operating channel width specified in the Channel Width subfield of the OM Control subfield received from the OMI initiator and subject to the restrictions defined in 27.3.1.2 (OFDMA).

* Link adaptation using the HLA Control subfield

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

A non-AP HE STA may set the UL HE TB PPDU MFB to 1 in the HLA Control field it transmits to the AP to indicate that the NSS, HE-MCS, DCM, BW and RU Allocation in the HLA Control field represent the recommended MFB for the HE TB PPDU sent from the non-AP HE STA. The AP should not exceed the recommended RU size indicated in the most recently received RU Allocation field of the HLA Control field when it sends a triggering frame*(#25126, 25068)* addressed to the STA.

* TXVECTOR and RXVECTOR parameters

**TGax Editor: *Change the row in the table below as follows (#CID 25126, 25068):***

|  |
| --- |
| * TXVECTOR and RXVECTOR parameters |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| L\_LENGTH | FORMAT is HE\_SU, HE\_MU or HE\_ER\_SU | Not present.  NOTE—The LENGTH field of the L-SIG field for HE PPDU is defined in Equation (27-11) using the TXTIME value defined in 27.4.3 (TXTIME and PSDU\_LENGTH calculation), which in turn depend on other parameters including the TXVECTOR parameter APEP\_LENGTH. | N | N |
| FORMAT is HE\_TB | Indicates the value in the LENGTH field of the L-SIG field in the range of 1 to 4095. The value is obtained from the triggering frame*(#25126, 25068)* to which the HE TB PPDU is a response. | Y | N |
| Otherwise | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) or Table 21-1 (TXVECTOR and RXVECTOR parameters). | | |

* Resource allocation for an HE TB PPDU

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

UL MU transmissions are preceded by a triggering frame*(#25126, 25068)* from the AP. The triggering frame*(#25126, 25068)* indicates the parameters, such as the duration of the HE TB PPDU, RU allocation, target RSSI and HE-MCS (see 9.3.1.22 (Trigger frame format), 9.2.4.6a.1 (TRS Control) and 26.5.2.3 (Non-AP STA behavior for UL MU operation)), required to transmit an HE TB PPDU.

**Annex C**

**TGax Editor: *Change the MIB variable below of this subclause as follows (#CID 25126, 25068):***

dot11ObssNbRuToleranceTime OBJECT-TYPE

SYNTAX Unsigned32 (0..3600)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"It is a status variable.

It is written by an external management entity. Changes take effect as soon as practical in the implementation.

This attribute indicates the minimum time that needs to pass since the reception of the last Beacon frame from an OBSS AP that did not indicate tolerance to narrow bandwidth RU in OFDMA before the STA can transmit a triggering frame*(#25126, 25068)* that allocates a 26-tone RU, or transmit an HE TB PPDU in a 26-tone RU."

DEFVAL { 1800 }

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

An AP with dot11MultiBSSIDImplemented equal to true shall not send a Trigger frame (other than an NFRP Trigger frame) with the TA field set to the transmitted BSSID to a non-AP STA that is associated with an AP corresponding to a nontransmitted BSSID(#24108) in the multiple BSSID set unless the AP has received an HE Capabilities element from non-AP STA with the Rx Control Frame To MultiBSS subfield in the HE MAC Capabilities Information field equal to 1. An AP with dot11MultiBSSIDImplemented equal to true may send an NFRP Trigger frame with the TA field set to the transmitted BSSID to a non-AP STA that is associated with an AP corresponding to a nontransmitted BSSID(#24108) in a multiple BSSID set.

An AP that transmits a Trigger frame shall set the TA field of the frame to the MAC address of the AP, except if dot11MultiBSSIDImplemented is true and the Trigger frame is directed to non-AP STAs from at least two different BSSs of a multiple BSSID set, in which case, the AP shall set the TA field of the frame to the transmitted BSSID.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25089, 25090):***

*(#25089, 25090)*

The AP shall set the UL Length subfield of a Trigger frame to the value given by Equation (27-11) with *m*= 2.

If an AP transmits a Trigger frame that allocates an RU that spans the entire HE TB PPDU bandwidth and assigns the RU to more than one non-AP STA (i.e., for UL MU-MIMO) and with the GI And HE-LTF Type subfield of the Common Info field set to indicate either 2x HE-LTF + 1.6 μs GI or 4x HE-LTF + 3.2 μs GI, the AP may set the MU-MIMO HE-LTF Mode subfield in the Common Info field of the Trigger frame to indicate either HE single stream pilot HE-LTF mode or HE masked HE-LTF sequence mode. Otherwise, the AP shall set the MU-MIMO HE-LTF Mode subfield in the Common Info field to indicate HE single stream pilot HE-LTF mode.

An AP that transmits Trigger frames in more than one A-MPDU in an HE MU PPDU shall set each subfield, except the Trigger Type, More TF, CS Required and Trigger Dependent Common Info subfields, in the Common Info field of the Trigger frame in one A-MPDU to the same value as the corresponding subfield in the Common Info field of the Trigger frames in the other A-MPDUs.

An AP that transmits frames carrying a TRS Control subfield in more than one A-MPDU in an HE MU PPDU shall set the UL Data Symbols and AP Tx Power subfields of the TRS Control subfield in the frames of one A-MPDU to the same value as the corresponding subfields of the TRS Control subfield in the frames of the other A-MPDUs.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 25126, 25068):***

An AP that transmits one or more Trigger frames in one or more A-MPDUs and frames carrying a TRS Control subfield in one or more other A-MPDUs in an HE MU PPDU shall set the Common Info field of the Trigger frames and the TRS Control subfields in each A-MPDU as follows:

* The UL Length subfield in the Common Info field of the Trigger frames and the UL Data Symbols subfield in the TRS Control subfields indicate the same HE TB PPDU duration
* The AP Tx Power subfield in the Common Info field of the Trigger frames and the AP Tx Power subfield in the TRS Control subfields indicate the same transmit power
* In the Common Info field of the Trigger frames:
* The MU-MIMO HE-LTF Mode and UL STBC subfields are set to 0
* The Number Of HE-LTF Symbols And Midamble Periodicity subfield is set to 0
* The Doppler subfield is set to 0
* The Pre-FEC Padding Factor subfield is set to 0 (i.e., to indicate a pre-FEC padding factor of 4)
* The UL Length subfield and the PE Disambiguity subfield are set to indicate the PE duration calculated with Equation (27-114) is the default PE duration value, which is indicated by the AP in the Default PE Duration subfield of the HE Operation element it transmits.(#24313)
* The UL Spatial Reuse subfield is set to PSR\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED
* If the TXVECTOR parameters HE\_LTF\_TYPE and GI\_TYPE of the HE PPDU carrying the Trigger frame are either 4xHE-LTF and 3u2s\_GI, respectively, or 2xHE-LTF and 1u6s\_GI, respectively, then the GI And HE-LTF Type subfield is set to 2. Otherwise, the GI And HE-LTF Type subfield is set to 1.

*(#25089, 25090)*NOTE—A non-AP STA obtains the information required to prepare an HE TB PPDU explicitly and implicitly. Explicit information is obtained in the Trigger frame or TRS Control subfield contained in the triggering PPDU(#24288). Implicit information is obtained in previously exchanged frames with the AP, e.g., in the BSS Color and the Default PE Duration subfields of the HE Operation element, or from default values specified in 26.5.2.3 (Non-AP STA behavior for UL MU operation).

An AP shall not set any subfields of the User Info field of a Trigger frame to a value that is not supported by the recipient non-AP STA of the User Info field and the AP. An AP shall set the values of the subfields of the Common Info field and User Info field of a Trigger frame such that the combination together would cause the solicited non-AP STA to construct a valid HE TB PPDU. An AP shall not set any subfields of a TRS Control subfield to a value that is not supported by the recipient non-AP STA of the TRS Control subfield and the AP. An AP shall set the values of the subfields of a TRS Control subfield such that the combination together would cause the solicited non-AP STA to construct a valid HE TB PPDU. If an RU is allocated to only one non-AP STA the Starting Spatial Stream subfield for that non-AP STA shall be set to 0.

NOTE—27.3.4 and 27.3.6.10 specify the requirements on each of the other remaining subfields, such that the solicited non-AP STAs each construct a valid HE TB PPDU in response to the Trigger frame.*(#25089, 25090)*

An AP shall follow the RU restriction rules defined in 27.3.2.8 (RU restrictions for 20 MHz operation) when assigning an RU to a 20 MHz operating non-AP STA for a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz HE TB PPDU. An AP shall not set the RU Allocation subfield of the User Info field of a Trigger frame or TRS Control subfield that is addressed to a non-AP STA to a value such that the RU allocated to the STA lies outside the channel in which the STA is operating (see 27.3.2.6 (Resource allocation for an HE TB PPDU), and 27.3.2.9 (80 MHz operating non-AP HE STAs)) or outside the SST subchannel (if applicable) in which the STA is operating (see 26.8.7 (HE subchannel selective transmission)).

If a Trigger frame is transmitted in the broadcast RU of an HE MU PPDU, then the Trigger frame shall not include any User Info fields addressed to a non-AP STA that is identified as recipient of another RU or spatial stream of the same HE MU PPDU.

A TRS Control subfield shall not be included in a group addressed frame.

If an AP transmits one or more Trigger frames or frames carrying a TRS Control subfield, then the frames shall collectively elicit HE TB PPDU responses such that at least one scheduled RU is allocated for each 20 MHz channel occupied by the eliciting PPDU. An AP shall not allocate an RU in any 20 MHz channel that is not occupied by the immediately preceding DL PPDU.

An AP may indicate an unallocated RU in a Trigger frame by including a User Info field with the AID12 subfield set to 2046. The AP shall place any User Info fields with the AID12 subfield set to 2046 after User Info fields with the AID12 subfield set to a value less than 2046.

An AP shall not transmit a Trigger frame that contains more than one User Info field with the same value in the AID12 subfield unless the value in the AID12 subfield is 0 or greater than 2007. The AP shall place User Info fields with the same value in the AID12 subfield together as a contiguous block in the Trigger frame. The AP shall place User Info fields with the AID12 subfield set to 0 or a value greater than 2007 after User Info fields with the AID12 subfield set to a value in the range 1 to 2007 (if any present).