IEEE P802.11`  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comment resolutions for 27.15.2 | | | | |
| Date: 2018-01-05 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Alfred Asterjadhi | Qualcomm Inc. | 5775 Morehouse Dr, San Diego, CA 92109 | +1-858-658-5302 | aasterja@qti.qualcomm.com |
| Robert Stacey | Intel Corp |  |  |  |
| Tianyu Wu | Samsung |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGax D2.0 with the following CIDs:

* 11261, 11495, 11504, 11563, 11687, 11689, 11690, 11902, 12003, 12061,
* 12532, 12533, 12553, 12554, 12627, 12649, 12650, 12656, 12865, 13639,
* 13947, 13948, 14123, 14329, 14124, 14126, 12099, 12100, 13640 (29 CIDs)

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Added resolutions for CIDs 14124, and 14126. Changes in green. Also updated the baseline to D2.2.
* Rev 2: Added resolutions for CIDs 12099, 12100 and 13640.
* Rev 3: Some editorial changes and clarifications received during the presentation. Changes in green.

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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 11261 | Alfred Asterjadhi | 314.59 | Since use of ER SU PPDUs may lead to low throughputs and other undesired effects enable the receiver to be able to disable its recepiton (similar to disabling low MCSs from AP or UL MU Disable). | As in comment. Will submit a proposal. | Revised –  Agree in principle with the comment. Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception at the AP side however with the flexibility of the AP to control its reception (enable disable) via the HE Operation element. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 11261. |
| 11495 | Chittabrata Ghosh | 314.59 | In the text "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1," the Partial Bandwidth Extended Range field refers to the support of higher 106-tone ER SU; however, the 242-tone ER SU should be defined with respect to support of 242-tone ER SU; define a new support field in the HE Capabilities element; | Define Full Bandwidth Extended Range field in the HE Capabilities element and link to the transmission of 242-tone HE ER SU PPDU. | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for the AP case. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 11495. |
| 11504 | Chunyu Hu | 315.32 | "If a Control frame is sent as a response to a soliciting HE ER SU PPDU the frame shall be carried in an HE ER SU PPDU except when the most recent successfully received PPDU sent by the responding STA to the soliciting STA after association was not an HE ER SU PPDU in which case the Control frame shall be carried in non-HT PPDU." is too restrictive. A STA receiving a trigger frame in ER PPDU may respond with TB MU PPDU with UL OFDMA to compensate the power inbalance. Change the rules in this section to allow this operation. | as in the comment | Rejected –  An HE TB PPDU cannot be solicited with an HE ER SU PPDU (please refer to the multiple subclauses that cover this context (9.2.4.5.4 (Ack Policy subfield), and 27.4.4.4 (Responding to an HE MU PPDU or HE SU PPDU with an HE TB PPDU). The power imbalance issue is solved using 106-tone ER SU PPDUs and/or the use of DCM modulation. |
| 11563 | Dorothy Stanley | 314.60 | Regarding "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1;", there is "DCM Max Constellation Rx" and "DCM Max NSS Rx", which one or both? This seems like a tricky way to make HE ER SU PPDU optional. Just add a PHY Capability bit and make it simpler and decoupled from DCM. | as in comment | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for the AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 11563. |
| 11687 | Duncan Ho | 314.51 | "A STA may transmit a Control frame in a non-HT PPDU." is redundant and actually adds ambiguity. non-HT PPDU is the go to format. See 10.7.6. Also already covered in para of P315L10. And second sentence is out of place. | 1) Remove "A STA may transmit a Control frame in a non-HT PPDU.". 2) Move "A first STA shall not transmit a Control frame in an HE ER SU PPDU to a second STA unless the second STA indicates the reception of HE ER SU PPDU." to the end of this sublause. Actually to remove ambiguity replace the last portion "indicates the reception of HE ER SU PPDU" with "indicates that the reception of HE ER SU PPDU is enabled". | Revised –  Agree with the comment. Proposed resolution accounts for the suggested changes.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 11687. |
| 11689 | Duncan Ho | 315.06 | Make the note more precise since when the frame is sent to another non-AP STA the flag is set to 0. Also generalize the second sentence as well. | Replace "UPLINK\_FLAG to 1 (see 27.11.2 (UPLINK\_FLAG)" with "UPLINK\_FLAG to 1 when the PPDU is intended to the AP and to 0 when the PPDU is intended to a TDLS STA (see 27.11.2 (UPLINK\_FLAG)". Replace the second sentence with "The MU PPDU format enables the non-AP STA to include the AID (transmitter's AID when UPLINK\_FLAG is 1 and receiver's AID when UPLINK\_FLAG is 0) in the PHY header of the PPDU and its use is out of scope of the standard." | Revised –  Agree in principle with the comment. Proposed resolution accounts for the suggested changes except that some minor editorials are applied as well.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 11689. |
| 11690 | Duncan Ho | 315.13 | ER SU PPDUs do not use STBC. So this condition never applies to these PPDU types. Remove ER SU PPDU from the item. | Delete "HE ER SU PPDU or". | Rejected –  ER SU PPDUs are allowed to use STBC. Please refer to TXVECTOR and RXVECTOR parameter table that specifies that STBC can be set for these FORMATs: FORMAT is HE\_SU, HE\_MU, HE\_EXT\_SU or HE\_TRIG. |
| 11902 | Hongyuan Zhang | 314.59 | "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1"-- this sentence is contradictory with 28.1.1, where Tx and Rx HE ER SU with 242-tone RU is mandatory (meaning no capability bits required). | Remove the sentence "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1" | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for the AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 11902. |
| 12003 | James Yee | 314.60 | The "DCM Rx field" is undefined. Probably should replace with the "DCM Max Constellation Rx" subfield in the HE PHY Capabilities Information field. | As suggested. | Revised –  Agree in principle with the comment. Proposed resolution fixes the issue.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12003. |
| 12061 | Jian Yu | 314.59 | HE ER 242 is a mandaotry mode and shall not depend on other featrures like DCM or ER 106 | Fix the bugs | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for the AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12061. |
| 12532 | Liwen Chu | 315.05 | This is not true for HE MU PPDU in TDLS link. | Fix the issue mentioned in comment. | Revised—  Agree in principle with te comment. Proposed resolution clarifies this aspect, following the suggestions provided by CID 11689.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12532. |
| 12533 | Liwen Chu | 314.59 | The mentioed capability bits have nothing to do with 242-tone ER SU | Fix the issue mentioned in comment. | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12533. |
| 12553 | Liwen Chu | 314.59 | The capbility bits are not related to 242 ER SU | Remove the sentence. | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12553. |
| 12554 | Liwen Chu | 315.05 | This is not true for TDLS | Fix the issue mentioned in comment. | Revised—  Agree in principle with te comment. Proposed resolution clarifies this aspect, following the suggestions provided by CID 11689.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12554. |
| 12627 | Mark RISON | 315.01 | Transmission of MU PPDUs by a non-AP STA has no appreciable value | Delete the Rx HE MU PPDU From Non-AP STA subfield in the HE PHY Capabilities Information field (Figure 9-589cl and Table 9-262aa) and "to a peer STA unless it has received from the peer STA an HE Capabilities element with the Rx HE MU PPDU From Non-AP STA subfield in the HE PHY Capabilities Information field equal to 1" and following NOTE in 27.15.2 | Rejected –  Transmission of MU PPDUs from a non-AP STA has the appreciable value that, compared to the SU and ER SU PPDU counterparts, the MU PPDU has a SIG-B field that contains additional information (most importantly the identifier of the transmitter or receiver) that can be used by the recipient of the MU PPDU to determine which is the generator of the PPDU even in those cases that the Data field of the PPDU itself has failed. Having this identification information within a failed packet (especially from a non-AP STA) is beneficial to provide knowledge to the recipient of a STA that is persistently failing in its attempt to deliver Data to it. |
| 12649 | Mark RISON | 314.51 | "A first STA shall not transmit a Control frame in an HE ER SU PPDU to a second STA unless the second STA indicates the reception of HE ER SU PPDU." -- there is no signalling to indicate (lack of) support for reception of HE ER PPDUs | Add an explicit HE PHY Capabilities bit to indicate support for HE ER PPDU rx | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12649. |
| 12650 | Mark RISON | 314.58 | "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1" -- this doesn't make sense: neither DCM nor upper-half ER are mandatory for full-width ER | Add an explicit HE PHY Capabilities bit to indicate support for RU242 HE ER PPDU rx | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12650. |
| 12656 | Mark RISON | 314.60 | "DCM Rx field" -- there is no such field | Change the cited text to "DCM Max Constellation Rx subfield in the HE PHY Capabilities Information field" | Revised –  Agree in principle with the comment. Proposed resolution fixes the issue.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 12656. |
| 12865 | Mark RISON | 314.48 | "An HE STA may transmit an HE SU PPDU to a peer HE STA." -- really? I'd never have guessed | Delete the cited text | Rejected –  The comment fails to identify a technical issue. The statement simpy indicates that an HE STA may generate an HE SU PPDU, without any constraints (such as optionality in the receiver side etc).  Unless there is a compelling reason to delete the sentence the preference is to keep it for clarity. |
| 13639 | Tianyu Wu | 314.61 | It's not natural to use a combination of two capability bits to indicate support of HE ER SU PPDU. | Add a capability bit for HE ER SU PPDU | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 13639. |
| 13947 | Yongho Seok | 314.59 | "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1; otherwise the STA shall not transmit a 242-tone HE ER SU PPDU to the peer STA." Even though the peer STA does not support either the DCM Rx or the Partial Bandwidth Extended Range, the peer STA does not have any issue for receiving a 242-tone HE ER SU PPDU. See the following in 28.1.1: An HE STA shall support the following features: -- Transmission and reception of an HE ER SU PPDU that consists of a 242-tone RU spanning the entire primary 20 MHz PPDU bandwidth Remove "otherwise the STA shall not transmit a 242-tone HE ER SU PPDU to the peer STA." | Because all HE STA shall support a transmission and reception of an HE ER SU PPDU that consists of a 242-tone RU, remove "otherwise the STA shall not transmit a 242-tone HE ER SU PPDU to the peer STA." | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 13947. |
| 13948 | Yongho Seok | 314.59 | "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA if it has received from the peer STA an HE Capabilities element with the DCM Rx field greater than 0 or with the Partial Bandwidth Extended Range field equal to 1; otherwise the STA shall not transmit a 242-tone HE ER SU PPDU to the peer STA." Because the DCM Rx field does not exist in an HE Capabilities element. The above sentence does not make sense. Also, technically, because all HE STA shall support a transmission and reception of an HE ER SU PPDU that consists of a 242-tone RU, any constraint for a transmission and reception a 242-tone ER SU PPDU is not needed. | Remove the cited sentence. | Revised –  Multiple comments are targeting this portion of the paragraph; with different preferences, optional, mandatory etc. Proposed resolution here covers one of these options which is to maintain the mandatory behavior for ER SU 242 PPDU reception however with the flexibility of the recipient to control its reception (enable disable) for an AP. And add bit in the OM Control field for the non-AP STA side.  This allows the recipient to indicate the transmitter to switch on and off the generation of ER SU PPDUs so that they are only transmitted over the air whenever necessary (STAs are far away from each other) and are not transmitted otherwise (STAs are nearby to each other). This way the impact of generating these frames is reduced to those cases where it is necessary.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 13948. |
| 14123 | Yuichi Morioka | 314.51 | "A STA may transmit a Control frame in a non-HT PPDU." This sentence is adding not adding any behavior. | Remove the sentence. | Accepted |
| 14329 | Zhou Lan | 315.32 | "If a Control frame is sent as a response to a soliciting HE ER SU PPDU the frame shall be carried in an HE ER SU PPDU except when the most recent successfully received PPDU sent by the responding STA to the soliciting STA after association was not an HE ER SU PPDU in which case the Control frame shall be carried in non-HT PPDU." is too restrictive. A STA receiving a trigger frame in ER PPDU may respond with TB MU PPDU with UL OFDMA to compensate the power inbalance. Change the rules in this section to allow this operation. | as in the comment | Rejected –  An HE TB PPDU cannot be solicited with an HE ER SU PPDU (please refer to the multiple subclauses that cover this context (9.2.4.5.4 (Ack Policy subfield), and 27.4.4.4 (Responding to an HE MU PPDU or HE SU PPDU with an HE TB PPDU). The power imbalance issue is solved using 106-tone ER SU PPDUs and/or the use of DCM modulation. |
| 14124 | Yuichi Morioka | 314.51 | The "first" and "second" notion is not adding anything. | Remove the words "first" and "second" | Revised –  Agree with the comment. Removed “first” and replaced “second” with “receiving”  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 14124. |
| 14126 | Yuichi Morioka | 314.55 | "An HE AP transmits..." should be reworded as "An HE may transmit" as in other sentences in this subclause. | As suggested. | Revised –  Agree with the comment. Accounted for the suggested changes.  TGax editor to make the changes shown in 11-18/0012r3 under all headings that include CID 14126. |
| 12099 | John Coffey | 331.55 | "HE ER SU PPDU format (HE\_EXT\_SU) ... is similar to the HE SU PPDU format". Yes, that's a fair summary: it's very similar indeed; in fact so similar that it's hard to justify its presence in the draft. While it may be possible to assert some sort of justification on the grounds of providing extended support for outdoor applications, any such justiifcation should be balanced against the benefits of having a compact specification composed of a minimum number of \*standard\* modes. A compact specification eases the tasks of developing and testing products, and helps the standardization process by reducing bloat and easing the task of review. In this case, the gains of this mode seem far too marginal to justify its inclusion in the ax amendment. | Remove the HE ER SU PPDU format and all references to it in the draft. | Rejected.  There are some differences between HE ER SU PPDU and HE SU PPDU as listed below: (i) HE-SIG-A is 16 us in HE ER SU PPDU while 8 us in HE SU PPDU (ii) L-STF and L-LTF are power boosted by 3 dB in HE ER SU PPDU while no power boost in HE SU PPDU. |
| 12100 | John Coffey | 331.57 | "Support for the HE ER SU PPDU format is mandatory." No persuasive justification for this requirement has ever been provided. The benefits provided by the format appear to be very marginal, being limited to a small extension of range in certain special cases. If the mode is to be in the draft at all, it should be optional. | Change "mandatory" to "optional" in this sentence. | Rejected.  Keep HE ER SU PPDU mandatory but allow STA to disable it using OM control field. |
| 13640 | Tianyu Wu | 328.8 | The HE ER SU feature should not be a mandatory feature. This feature will not be tested and may not be supported in all devices, so there will be interoperability issue if no capability signaling. | Add a capability bit for HE ER SU PPDU. | Rejected.  Keep HE ER SU PPDU mandatory but allow STA to disable it using OM control field. |

**Discussion: *None.***

* + 1. PPDU format selection

An HE STA that transmits non-HT, HT, or VHT PPDUs shall follow(#5511) the rules defined in 10.7 (Multirate support). An HE STA may transmit an HE SU PPDU (#4808)to a peer HE STA.

**TGax Editor: *Change the two paragraphs below of this subclause as follows (#CID 11687, 14123, 14124, 14126):***

*(#11687, 141237, 14124)* (#5735)

An HE AP may transmit an HE MU PPDU as defined in 27.5.1 (HE DL MU operation). A non-AP HE STA(#6256) transmits HE TB PPDUs as defined in 27.5.3 (UL MU operation).*(#14126)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 11689, 12532, 12554):***

NOTE—A non-AP STA transmitting an HE MU PPDU sets the TXVECTOR parameter UPLINK\_FLAG to 1 if the PPDU is sent to the AP and to 0 when the PPDU is sent to a single TDLS STA (see 27.11.2 (UPLINK\_FLAG)). This HE MU PPDU format enables the non-AP STA to include its AID (transmitter's AID if the UPLINK\_FLAG is 1 and the receiver’s AID if the UPLINK\_FLAG is 0) in the PHY header of the PPDU and its use is out of scope of the standard. *(#11689, 12532, 12554)* (#4789, #5217, #5218, #5219, #7034, #9961)

An HE STA shall send Control frames (#5220)following the rules defined in 10.7.6 (Rate selection for Control frames)) with the following exceptions:

* A Control frame sent in response to an HE ER SU PPDU or(#Ed) HE SU PPDU(#8525, #7582) that uses STBC shall be carried in the same PPDU(#5513) format as the soliciting PPDU.
* A Control frame sent by the AP as a response to an HE TB PPDU may be carried in any PPDU format that is supported by the intended receiver(s).
* A Trigger frame that is not an MU-RTS Trigger frame may be carried in any PPDU format that is supported by the intended receiver(s).(#8526)
* A Control frame is carried in an HE TB PPDU when it is sent as a response to a PPDU(#8526) thatcontains a Trigger frame that is not an MU-RTS Trigger frame or if it is sent as a response to a PPDU that contains a frame containing a UMRS Control fields(see 27.5.3 (UL MU operation)). *(#Ed)*
* An Ack frame sent as a response to an HE ER SU PPDU or HE SU PPDU containing an FTM frame shall be sent in the same PPDU format as the soliciting PPDU except when the FTM frame is carried in HE SU PPDU and the most recent successfully received PPDU sent by the responding STA to the soliciting STA after association was an HE ER SU PPDU in which case the Control frame shall be carried in HE ER SU PPDU.(#9963)
* If a Control frame is sent as a response to a soliciting HE ER SU PPDU the frame shall be carried in an HE ER SU PPDU except when the most recent successfully received PPDU sent by the responding STA to the soliciting STA after association was not an HE ER SU PPDU in which case the Control frame shall be carried in non-HT PPDU.
* If the Control frame is sent as a response to a soliciting HE SU PPDU then the frame shall be carried in a(#5515) non-HT PPDU except when the most recent successfully received PPDU sent by the responding STA to the soliciting STA after association was an HE ER SU PPDU in which case the Control frame shall be carried in an(#5516) HE ER SU PPDU.

NOTE 1—PPDU format switching between non-HT and ER SU PPDU occurs in subsequent TXOPs. A STA that solicits a Control frame from a responding STA accounts for the PPDU format of the Control frame to calculate the expected duration of the TXOP. The responding STA determines that the most recent PPDU sent to the soliciting STA is successfully received if it receives an immediate acknowledgment by the soliciting STA in response to the PPDU.

**TGax Editor: *Insert the note below at the end of this subclause as follows (#CID 11687, 14124):***

NOTE 2 --does receivingreceivingthat is enabled (see 27.15.2 (PPDU format selection) *(#11687, 14124)*

* PPDU format selection

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 11261, 11495, 11563, 11902, 12061, 12533, 12553, 12649, 12650, 13639, 13947, 13948, 12656, 12003):***

An HE STA may transmit a 242-tone HE ER SU PPDU to an non-AP HE STA unless the most recently received OM Control field sent from that non-AP HE STA has the ER SU Disable subfield equal to 1. An HE STA shall not transmit a 242-tone HE ER SU PPDU to a STA if the most recently received OM Control subfield from that STA has the ER SU Disable subfield equal to 1.(#4808) A non-AP HE STA may transmit a 242-tone HE ER SU PPDU to an HE AP unless the most recently received HE Operation element from that AP has the ER SU Disable subfield equal to 1. A non-AP HE STA shall not transmit a 242-tone HE ER SU PPDU to an AP if the most recently received HE Operation element by the AP has the ER SU Disable subfield equal to 1. The HE STA may transmit a 106-tone HE ER SU PPDU to a STA if it has received from the STA an HE Capabilities element with the Partial Bandwidth Extended Range field(#7153) equal to 1; otherwise the STA shall not transmit a 106-tone HE ER SU PPDU to the peer STA.

**TGax Editor: *Insert “ER SU Disable” as B17 of Figure 9-589cr(HE Operation Parameters field format) in subclause 9.4.2.238 (HE Operation element).***

**TGax Editor: *Insert the paragraph below at the end of subclause 9.4.2.238 (HE Operation element) (#CID 11261, 11495, 11563, 11902, 12061, 12533, 12553, 12649, 12650, 13639, 13947, 13948, 12656, 12003):***

The ER SU Disable subfield indicates whether 242-tone HE ER SU PPDU reception is disabled or enabled by the AP. The ER SU Disable subfield is set to 1 to indicate that 242-tone HE ER SU PPDU reception is disabled; otherwise it is set to 0 to indicate that 242-tone HE ER SU PPDU reception is enabled.

**TGax Editor: *Insert “ER SU Disable” as B10 of Figure 9-15d (Control Information subfield for OM Control) in subclause 9.2.4.6a.2 (OM Control).***

**TGax Editor: *Insert the paragraph below at the end of subclause 9.2.4.6a.2 (OM Control) (#CID 11261, 11495, 11563, 11902, 12061, 12533, 12553, 12649, 12650, 13639, 13947, 13948, 12656, 12003):***

The ER SU Disable subfield indicates whether 242-tone HE ER SU PPDU reception is disabled or enabled by the non-AP STA. The ER SU Disable subfield is set to 1 to indicate that 242-tone HE ER SU PPDU reception is disabled; otherwise it is set to 0 to indicate that 242-tone HE ER SU PPDU reception is enabled. The ER SU Disable subfield is reserved when sent by an AP.

**27.16.5 ER beacon generation in an ER BSS**

**TGax Editor: *Insert the following paragraph as the second paragraph of this subclause:***

An HE AP that sets up an ER BSS shall not set the ER SU Disable subfield in the HE Operation element it transmits to 1.

**27.16.1 Basic HE BSS functionality**

**TGax Editor: *Insert the following paragraph after the paragraph below:***

An HE AP corresponding to the ER BSS shall not respond to the Probe Request or (Re)Association Request frames sent from a non-HT STA, or an HE STA that does not support Partial Band Extended Range capability if the HE AP transmits ER Beacon in HE\_ER\_SU PPDU with 106-tone RU. An HE AP that is not operating an ER BSS may set the ER SU Disable subfield in the HE Operation element it transmits to 1.