IEEE P802.11
Wireless LANs

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| LB238 CR PPDU format, BW, MCS, NSS, and DCM selection |
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Abstract

This submission proposes resolutions of comments received from TGax LB238.

(The proposed change is based on TGax Draft 4.1.)

* CIDs: 20910, 20912, ~~20743,~~ 20749, ~~21513, 20237,~~ 20829, ~~20606, 20713,~~ 20940, 20938, ~~20913, 20690,~~ 20129, 21100 (15 CIDs)

NOTE1: CID 21100 is an editorial comment of sub-clause 9.3.1.22.1 (General). But, since it is related with CID 20713, the resolution of CID 21100 is also included.

NOTE2: In 11-19/770r2, CID 20743, 21513, 20237, 20606, 20713, 20913, 20690 are deferred.

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** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 20910 | 418.54 | 26.15.2 | Talk of "peer STA" is confusing as it can be misunderstood as referring to TDLS | At 418.54 change "An HE STA may transmit a 242-tone HE ER SU PPDU to a peer HE STA unless the most recently receivedOM Control field from that peer HE STA has the ER SU Disable subfield equal to 1 in which case the HESTA shall not transmit a 242-tone HE ER SU PPDU to that peer HE STA." to "An HE STA shall not transmit a 242-tone HE ER SU PPDU to an HE STA if the most recent OM Control field received, if any, from that STA has the ER SU Disable subfield equal to 1." | Rejected- In the baseline, the terminology of the peer STA is already used in a general context, not just for the TDLS. In the TDLS, we are using a different terminology like the TDLS peer STA.  |
| 20912 | 418.62 | 26.15.2 | "An HE STA may transmit a 106-tone HE ER SU PPDU to a STA if it has received from the STA an HECapabilities element with the Partial Bandwidth Extended Range field equal to 1; otherwise" -- not if the receiving STA has transmitted ER SU Disable | Change the cited text at the referenced location to "An HE STA may transmit a 106-tone HE ER SU PPDU to a non-AP STA if it has received from the STA an HECapabilities element with the Partial Bandwidth Extended Range field equal to 1 and the most recent OM Control field received, if any, from that STA has the ER SU Disable subfield equal to 0. An HE STA may transmit a 106-tone HE ER SU PPDU to an AP if it has received from the AP an HECapabilities element with the Partial Bandwidth Extended Range field equal to 1 and the most recent HE Operation element received from that AP has the ER SU Disable subfield equal to 0. Otherwise" | Rejected-The ER SU Disable subfield in an HE Operation element or OM Control field controls only a transmission of the 242-tone HE ER SU PPDU.When a peer STA supports a 106-tone HE ER SU PPDU, an HE STA can transmit a 106-tone HE ER SU PPDU to the peer STA regardless of the ER SU Disable subfield. |
| ~~20743~~ | ~~419.01~~ | ~~26.15.2~~ | ~~Re CID 16120: transmission of HE MU PPDUs by non-AP STAs has no appreciable value. The suggestion made in CID 12627 is dubious and there is no evidence of any market interest in the feature~~ | ~~Change the Rx Partial BW SU Using HE MU PPDU From Non-AP STA subfield in the HE PHY Capabilities Information field (Figure 9-772c and Table 9-321b) and at 419.1 in 26.15.2 change "a 20 MHz HE MU PPDU with a single 106-tone RU to a peer STA unless it has received from the peerSTA an HE Capabilities element with the Rx HE MU PPDU From Non-AP STA subfield in the HE PHYCapabilities Information field equal to 1" to "an HE MU PPDU" and delete following NOTE~~ | ~~Revised-~~ ~~The comment fails to identify a technical issue.~~~~AI: Will consider to add the related NOTE.~~  |
| 20749 | 419.05 | 26.15.2 | Re CID 16135: the second part ("transmitter's AID if the UPLINK\_FLAG is 1 and the receiver's AID if the UPLINK\_FLAG is 0" -- the link between the AID (actually STA-ID) setting and the UPLINK\_FLAG setting is not required by the spec anywhere) was not addressed in the resolution | Add a normative statement that the STA-ID shall be set to the transmitter's AID if the UPLINK\_FLAG is 1 and to the receiver's AID if it's set to 0 | Revised- The first paragraph of subclause 26.11.1 already has the normative statement that suggested by the commenter. But, when the UPLINK\_FLAG is to 0, there is an ambiguity whether the first paragraph of subclause 26.11.1 covers the TDLS peer STA. The proposed change is to clarify that the STA-ID of the HE MU PPDU sent to the TDLS peer STA is set to the 11 LSBs of the AID of the recipient.TGax editor makes changes as specified in 11-19/0770r2 for CID 20749. |
| ***TGax Editor: Change the subclause 26.11.1 (STA\_ID\_LIST) as follows (#20749):*** Each element of the TXVECTOR parameter STA\_ID\_LIST identifies the STA or group of STAs that is therecipient of an RU in the HE MU PPDU. An individually addressed RU is an RU addressed to either an associated non-AP STA or a TDLS peer STA and the STA\_ID\_LIST element for that RU is set to the 11 LSBs of the AID of the STA receiving the PSDU contained in that RU. |
| ~~21513~~ | ~~419.45~~ | ~~26.15.2~~ | ~~"A Control frame sent as a response to an HE SU 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 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 should be carried in an HE ER SU PPDU."In addition to an HE SU PPDU, the non-HT PPDU should need the same rule. For example, an AP sends a RTS frame in a non-HT PPDU format and a STA responds with a CTS in an HE ER SU PPDU format.~~ | ~~Change "A Control frame sent as a response to an HE SU PPDU that does not contain a Trigger frame or..." to "A Control frame sent as a response to an HE SU PPDU or a non-HT PPDU that does not contain a Trigger frame or..."~~ | ~~Accepted~~~~AI: Have an offline discussion.~~ |
| ~~20237~~ | ~~419.47~~ | ~~26.15.2~~ | ~~The statement is wrong~~ | ~~Change the text as below:"unless the most recent received PPDU sent by the soliciting STA to the responding STA..."~~ | ~~Revised-~~ ~~The current statement is correct.~~ ~~The comment fails to identify a technical issue.~~~~AI: Will consider the wording change for more clarification.~~  |
| 20829 | 420.06 | 26.15.2 | "An HE STA should send an Ack frame in the same PPDU format as the soliciting PPDU if the solicitingPPDU is a VHT PPDU or HT PPDU containing an FTM frame." -- why is this restricted to HE STAs? 10.6.6.1 g) has no such restriction | Change "An HE" to "A" in the cited text | Rejected- The statement in 10.6.6.1 covers the legacy STA and use “may” hehavior. But, in 26.15.2, it is recommending that an HE STA uses the same PPDU format as the soliciting PPDU.  |
| ~~20606~~ | ~~420.07~~ | ~~26.15.2~~ | ~~"An HE STA should send an Ack frame in the same PPDU format as the soliciting PPDU if the solicitingPPDU is a VHT PPDU or HT PPDU containing an FTM frame." -- this is outside the scope of the TGax PAR and should be left to TGm or TGaz. Also, there is no such thing as an FTM frame~~ | ~~Delete the cited text at the referenced location. Also delete the proposed bullet g) in 10.6.6.1~~ | ~~Revised-~~ ~~The cited text is in the scope of the TGax PAR.~~ ~~In previous letter ballot, TGax had debated how to support the FTM operation for the HE STA.~~ ~~And, as the conclusion, the HE STA has this recommendation.~~ ~~But, if the TGm decides that all STAs (including the legacy HT/VHT STA) follows this recommendation, the cited text can be removed from TGax draft.~~ ~~But, regarding the last comment, the FTM frame should be changed to the Fine Timing Measurement frame.~~ ~~TGax Editor replaces “FTM frame” with “Fine Timing Measurement frame” throughout the TGax Draft 4.1.~~~~AI: Have an offline discussion.~~ |
| ~~20713~~ | ~~420.51~~ | ~~26.15.3~~ | ~~Re CID 15958: the resolution missed the point of the comment. The comment was about the Tx 1024-QAM Support < 242-tone RU at the AP, not about the Tx 1024-QAM Support < 242-tone RU at the non-AP STA. The point is that an AP must not tell a STA to use narrow RUs with 1024-QAM if it has told the STA that it doesn't support them. Also, editorials~~ | ~~Change "An HE AP shall not set UL MCS subfield of the User Info field in a Trigger frame to 10 or 11 for a 26-, 52-, or 106-tone RU allocation unless the User Info field is addressed to a non-AP HE STA from which the HEAP has received an HE Capabilities element with the Tx 1024-QAM < 242-tone RU Support subfield in theHE PHY Capabilities Information field equal to 1." to "An HE AP shall not set the UL MCS subfield of a User Info field in a Trigger frame to 10 or 11 for a 26-, 52-, or 106-tone RU allocation unless it has set the Rx 1024-QAM < 242-tone RU Support subfield in the HE PHY Capabilities Information field of the HE Capabilities element to 1 and the User Info field is addressed to a non-AP HE STA from which the HE AP has received an HE Capabilities element with the Tx 1024-QAM < 242-tone RU Support subfield in the HE PHY Capabilities Information field equal to 1.". Also, in the para above change "if it has received from the recipient STA" to "if it has received from that STA"~~ | ~~Revised-~~ ~~Agree with the comment.~~ ~~But, the issue is more general.~~ ~~The AP shall not set any subfields of a Trigger frame to a value that is not supported by the AP.~~~~TGax editor makes changes as specified in 11-19/0770r2 for CID 20713.~~ ~~AI: Have an offline discussion.~~ |
| ***TGax Editor: Change the subclause 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield) as follows (#20713):*** An AP shall not set any subfields of the Common Info field of a Trigger frame to a value that is not supported by all the recipient non-AP STAs of the Trigger frame and the AP.…An AP shall not set any subfields of the User Info field of a Trigger frame to a value that is not supported by either the recipient non-AP STA of the User Info field or the AP. An AP shall not set any subfields of a TRS Control subfield to a value that is not supported by either the recipient non-AP STA of the TRS Control subfield or the AP. When 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. |
| 21100 | 104.42 | 9.3.1.22.1 | Phrase missing the word "of/for the" - "The UL Length subfield of the Common Info field indicates the value of the L-SIG LENGTH field the solicitedHE TB PPDU. The UL Length subfield shall use the value m = 2 in Equation (27-11)." | Modify text as follows with new capitalized words: "The UL Length subfield of the Common Info field indicates the value of the L-SIG LENGTH field 'OF/FOR THE' the solicited HE TB PPDU. The UL Length subfield shall use the value m = 2 in Equation (27-11)." | Revised- Agree in principle. Additionally, because clause 9 can’t have any “shall” sentence, it is proposed to move "The UL Length subfield shall use the value m = 2 in Equation (27-11)." to subclause 26.5.2.2.4. TGax editor makes changes as specified in 11-19/0770r2 for CID 21100. |
| ***TGax Editor: Change the subclause 9.3.1.22.1 (General) as follows:*** The UL Length subfield of the Common Info field indicates the value of the L-SIG LENGTH field of the solicited HE TB PPDU. ~~The UL Length subfield shall use the value m = 2 in Equation (27-11).~~***TGax Editor: Insert the following after 3rd paragraph of the subclause 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield):*** The AP shall set the UL Length subfield of a Trigger frame to the value given by Equation (27-11) with *m set to 2*. |
| 20940 | 421.34 | 26.15.3 | "set the RU Allocation subfield in the Trigger frame to less than or equal to the max RU size indicated in the DCM Max RU subfield" makes no sense cine the RU Allocation subfield is basically an enumeration, not a number | Change the cited text at the referenced location to "set the RU Allocation subfield in the Trigger frame to indicate an RU size that is less than or equal to the maximum RU size indicated in the DCM Max RU subfield" | Accepted |
| 20938 | 421.46 | 26.15.3 | "set the Number Of Spatial Streams subfield in the SSAllocation subfield in the User Info field to less than or equal to the value indicated in the DCM Max NSSTx subfield" is ambiguous because the field value is the value to be indicated minus one | Change to "set the Number Of Spatial Streams subfield in the SSAllocation subfield in the User Info field to less than or equal to the DCM Max NSSTx subfield" | Accepted |
| ~~20913~~ | ~~422.09~~ | ~~26.15.2~~ | ~~"TX parameter switching" is an undefined concept, and the NOTE has nothing to do with the preceding text anyway~~ | ~~Delete the NOTE at the referenced location~~ | ~~Revsied-~~ ~~Clarify the NOTE.~~  |
| ~~20690~~ | ~~422.17~~ | ~~26.15.4.1~~ | ~~The "at that bandwidth" deletions made in 18/2085 in "Otherwise,If the Operating Mode field is received from the first HE STA, the <HE-MCS, NSS> tuple is supported by the first STA on receive as defined 9.4.2.241.4 (Supported HE-MCS And NSS Set field) and by Equation (9-ax2).If the OM Control subfield is received from the first HE STA, the <HE-MCS, NSS> tuple is supported by the first STA on receive as defined 9.4.2.241.4 (Supported HE-MCS And NSS Set field) and by Equation (9-ax2)."(note other instances left behind) and"Otherwise, if the Max HE-MCS For n SS subfield (n = NSS) in each Tx HE-MCS Map For b subfield for b \member {<= 80 MHz, 160 MHz, 80+80 MHz} indicates support, then the <HE-MCS, NSS> tuple is supported by the first STA on transmit as defined in 9.4.2.241.4 (Supported HE-MCS And NSS Set field)." are wrong because the set is defined above as being for each "bandwidth (<= 80 MHz, and 160 MHz or 80+80 MHz)"~~ | ~~Revert the "at that bandwidth" deletions made per 18/2085~~ | ~~Revised-~~~~As in the comment, <HE-MCS, NSS> tuples are defined for each NSS and bandwidth.~~~~But, based on the discussion of 18/2085, the bandwidth may make a confusion because it can be misunderstood as the PPDU bandwidth.~~~~So, instead of using the bandwidth, the proposal is to use <operating channel width, PPDU bandwidth> combination.~~ ~~TGax editor makes changes as specified in 11-19/0770r2 for CID 20690.~~~~AI: Have an offline discussion.~~ |
| ***TGax Editor: Change the subclause 26.15.4 as follows:*** * Rate selection constraints for HE STAs
* Rx Supported HE-MCS and NSS Set

The Rx supported HE-MCS and NSS set of a first HE STA is determined by a second HE STA for each <HE-MCS, NSS> tuple NSS = 1, …, 8 and ~~bandwidth~~ a <operating channel width, PPDU bandwidth> combination as defined in Table 9-321c (Subfields of the Supported HE-MCS And NSS Set field) ~~( 80 MHz, and 160 MHz or 80+80 MHz)~~ from the Supported HE-MCS And NSS Set field of the HE Capabilities element received from the first STA as follows:* If support for the HE-MCS for NSS spatial streams at that ~~bandwidth~~ <operating channel width, PPDU bandwidth> combination is mandatory (see 27.1.1 (Introduction to the HE PHY)), then the <HE-MCS, NSS> tuple at that ~~bandwidth bandwidth~~ <operating channel width, PPDU bandwidth> combination is supported by the first STA on receive.
* Otherwise, if the Max HE-MCS For *n* SS subfield (*n* = NSS) in each Rx HE-MCS Map For *b* subfield for *b*  { 80 MHz, 160 MHz, 80+80 MHz} indicates support and neither the Operating Mode field nor the OM Control subfield is received from the first HE STA, then the <HE-MCS, NSS> tuple at that ~~bandwidth bandwidth~~ <operating channel width, PPDU bandwidth> combination is supported by the first STA on receive as defined in 9.4.2.242.4 (Supported HE-MCS And NSS Set field).
* Otherwise,
* If the Operating Mode field is received from the first HE STA, the <HE-MCS, NSS> tuple at that ~~bandwidth~~ <operating channel width, PPDU bandwidth> combination is supported by the first STA on receive as defined 9.4.2.242.4 (Supported HE-MCS And NSS Set field) and by Equation (9-ax2).
* If the OM Control subfield is received from the first HE STA, the <HE-MCS, NSS> tuple at that ~~bandwidth~~ <operating channel width, PPDU bandwidth> combination is supported by the first STA on receive as defined 9.4.2.242.4 (Supported HE-MCS And NSS Set field) and by Equation (9-ax2).
* Otherwise, the <HE-MCS, NSS> tuple at that ~~bandwidth bandwidth~~ <operating channel width, PPDU bandwidth> combination is not supported by the first STA on receive.

The <HE-MCS, NSS> tuples excluded by 26.15.4.3 (Additional rate selection constraints for HE PPDUs) can also be eliminated from the Rx supported HE-MCS and NSS set.An HE STA shall not, unless explicitly stated otherwise, transmit an HE PPDU unless the <HE-MCS, NSS> tuple and ~~bandwidth bandwidth~~ <operating channel width, PPDU bandwidth> combination used are in the Rx supported HE-MCS and NSS set of the receiving STA(s).* Tx Supported HE-MCS and NSS Set

The Tx supported HE-MCS and NSS set of a first HE STA is determined by a second STA for each <HE-MCS, NSS> tuple NSS = 1, …, 8 and ~~bandwidth bandwidth~~ <operating channel width, PPDU bandwidth> combinations as defined in Table 9-321c (Subfields of the Supported HE-MCS And NSS Set field) ~~( 80 MHz, and 160 MHz or 80+80 MHz)~~ from the Supported HE-MCS And NSS Set field received from the first STA as follows:* If support for the <HE-MCS, NSS> tuple at that ~~bandwidth~~ <operating channel width, PPDU bandwidth> combination is mandatory (see 27.1.1 (Introduction to the HE PHY)), then the <HE-MCS, NSS> tuple at that ~~bandwidth~~ <operating channel width, PPDU bandwidth> combination is supported by the first STA on transmit.
* Otherwise, if the Max HE-MCS For *n* SS subfield (*n* = NSS) in each Tx HE-MCS Map For *b* subfield for *b*  { 80 MHz, 160 MHz, 80+80 MHz} indicates support, then the <HE-MCS, NSS> tuple at that <operating channel width, PPDU bandwidth> combination is supported by the first STA on transmit as defined in 9.4.2.242.4 (Supported HE-MCS And NSS Set field).
* Otherwise, the <HE-MCS, NSS> tuple at that ~~bandwidth~~ <operating channel width, PPDU bandwidth> combination is not supported by the first STA on transmit.

A non-AP STA may exclude certain numbers of space-time streams, *NSTS*, as defined in 26.9.3 (Transmit operating mode (TOM) indication) from its Tx supported HE-MCS and NSS set. |
| 20129 | 423.65 | 26.15.4.3 | This sentence is not phrased correctly. Please fix it accordingly, ensuring that the minimum rate requirement applies to any PPDU (not only HE PPDUs) and that the field name is cited correctly "Minimum Rate" field. | As in comment. | Revised- Agree in principle. The minimum rate requirement is applied to both non-HT PPDU and HE PPDU. TGax editor makes changes as specified in 11-19/0770r2 for CID 20129. |
| ***TGax Editor: Change the subclause 26.15.4.3 as follows:*** A STA that operates in the 6 GHz band and receives a Minimum Rate field from its associated AP shall transmit a non-HT PPDU with a data rate which is not less than the data rate announced by the Minimum Rate field or an HE PPDU with an <HE-MCS, NSS> tuple the data rate of which is not less ~~that~~ than the data rate announced by the ~~Lowest~~ Minimum Rate field. |