### IEEE P802.11Wireless LANs

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| **11ax sounding comments D4.0** |
| Date: 4 July 2019 |
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Abstract

This document contains proposed resolutions for sounding related comments on 802.11ax draft 4.0 (xx CIDs).

R2:

1. 20198 20222 20223 20224 20225 20226 20618 20675 20824 20869
2. 20992 21002 21013 21014 21016 21018 21019 21609 21615 21613

R1:

1. 20198 20222 20223 20224 20225 20226 20618 20675 20824 20869
2. 20992 21002 21013 21014 21016 21018 21019 21609 21615

R0:

1. 20198 20222 20223 20224 20225 20226 20618 20675 20824 20869
2. 20992 21002 21013 21014 21016 21018 21019 21325 21326 21609
3. 21615

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| --- | --- | --- | --- | --- | --- |
| **CID** | **page.****line** | **clause** | **comment** | **proposed change** | **proposed resolution** |
| 21613 | 356.36 | 26.7.1 | "NOTE--Use of HE TB sounding does not necessarily imply MU feedback. HE TB sounding is also used to obtain SU feedback and CQI feedback.". The note is written in a way that HE TB sounding sequence can be used for all the feedback type which is true. On the other hand, Non TB based sequence is designed not only for SU type of feedback but also CQI feedback. So an note should be added to convey this information. | As stated in the comment. | Rejected - the comment does not identify a technical issue in sufficient detail. |
| 20198 | 358.01 | 26.7.3 | HE MU sounding feedback can be obtained using HE TB sounding sequence. When UL MU is disabled by the non-AP STA, AP's DL MU-MIMO transmission can not be performed due to this constraint and this limitation contraints 11ax performance/gain. | Extend the paragraph as follows:An MU beamformer may solicit full bandwidth MU or CQI feedback from an MU beamformee in an HE non-TB sounding sequence ... | Rejected - the current text reflects what was decided in the task group. The requested addition of a new sounding option is considered to add complexity without sufficient technical justification. (Copy of CID 15692, which was previously rejected. CID 16672 explicitly added that "An MU beamformer shall not solicit MU feedback in an HE non-TB sounding seqeunce.".) |
| 20222 | 357.48 | 26.7.2 | Allow SU beamformer soliciting partial BW SU feedback, just like allowing SU beamformer soliciting CQI-only feedback. This is to assist DL OFDMA operation. | Remove:"An SU beamformer shall not solicit partial bandwidth SU feedback in an HE non-TB sounding sequence " | Rejected - the current text reflects what was decided in the task group. The requested addition of a new sounding option is considered to add complexity without sufficient technical justification. (Copy of CID 15687, 15689, 15692, which were previously rejected.) |
| 20223 | 357.55 | 26.7.2 | allow non-TB sounding sequence to solicit MU feedback as well. | Change the paragraph as below:"An MU beamformer may solicit full bandwidth MU feedback from an MU beamformee in an HE TB or no-TB sounding sequence. An MU beamformer may solicit partial bandwidth MU feedback from an MU beamformee in an HE TB or non-TB sounding sequence if the MU beamformee indicates support by setting the Triggered MU Beamforming Partial BW Feedback subfield to 1." | Rejected - the current text reflects what was decided in the task group. The requested addition of a new sounding option is considered to add complexity without sufficient technical justification. (Copy of CID 15692, which was previously rejected. CID 16672 explicitly added that "An MU beamformer shall not solicit MU feedback in an HE non-TB sounding seqeunce.".) |
| 20224 | 359.57 | 26.7.3 | Should allow SU beamformer to solicit partial BW feedback20225, 20226 | Remove the paragraph of:"An HE beamformer shall not initiate an HE non-TB sounding sequence with an HE NDP Announcement frame that has a Partial BW Info field that indicates less than full bandwidth (see Table 26-4 (Settings for BW, RU Start Index, and RU End Index fields in HE NDP Announcement frame))." | Rejected - the current text reflects what was decided in the task group. The requested addition of a new sounding option is considered to add complexity without sufficient technical justification. (Copy of CID 15687, 15689, 15692, which were previously rejected.) |
| 20225 | 361.12 | 26.7.3 | SU beamformee may take the Ng, codebook, and Nc parameters from the NDPA STA\_INFO field as well. | Add following statement:"The HE beamformee can optionally take the Ng, codebook size, and Nc parameters from the STA Info in NDP Announcement frame." | Rejected - the current text reflects what was decided in the task group. The requested addition of a new sounding option is considered to add complexity without sufficient technical justification. (Copy of CID 15690, 15693, which were previously rejected.) |
| 20226 | 363.45 | 26.7.3 | If allows SU beamformee optionally to take the SU feedback parameters from NDPA's STA\_INFO field, then these fields (feedback type & Ng, codebook size and Nc) are allowed to have non zero values. | Remove:"An HE beamformer soliciting SU feedback in an HE non-TB sounding sequence shall set the Feedback Type And Ng, Codebook Size and Nc subfields in the HE NDP Announcement frame to 0." | Rejected - the current text reflects what was decided in the task group. The requested addition of a new sounding option is considered to add complexity without sufficient technical justification. (Copy of CID 15690, 15693, which were previously rejected.) |
| 20618 | 128.55 | 9.4.1.65 | This subclause is missing some of the material in the subclause on the VHT CBR field, e.g. the "where Na is the number of angles used for the compressed beamforming feedback matrix subfield" (i.e. Na is not actually defined anywhere) and "No padding is present between angles in the VHT Compressed Beamforming Report information, even if they correspond to different subcarriers. If the size of the VHT Compressed Beamforming Report information is not an integer multiple of 8 bits, up to seven zeros are appended to the end of the field to make its size an integer multiple of 8 bits." (i.e. the padding is not defined - there are some SU cases where 4 zero bits need to be appended) | Insert the cited text (changing VHT to HE) in the locations that parallel their locations in the subclause on the HE CBR field |   |
| 20675 | 128.38 | 9.4.1.64 | "In an HE Compressed Beamforming/CQI frame not carrying an HE compressed beamforming/CQI report, " -- not clear how this would ever happen | Give an explanation or xref (see VHT equivalent) | Rejected - the comment does identify a technical issue in sufficient detail. The HE equivalent does not provide more detail either. |
| 20824 | 361.42 | 26.7.3 | "the maximum number of space-time streams that the STA can receive in an HE sounding NDP" needs to be tied more explicitly to Nr | At 361.42, after "The HE beamformee indicates the maximum number of space-time streams it can receive in an HE sounding NDP, NSTS,max, as defined in 26.7.2 (Sounding sequences and support)." add "This maximum is the maximum number it can support for Nr in a compresed beamforming feedback matrix." | Revised - At 361.42, after "The HE beamformee indicates the maximum number of space-time streams it can receive in an HE sounding NDP, NSTS,max, as defined in 26.7.2 (Sounding sequences and support)." add "This maximum is the maximum number it can support for Nr in a compressed beamforming feedback matrix." |
| 20869 | 357.21 | 26.7.2 | Re CID 15966: the resolution is not clear (reference to just "<this document>") but in any case the issue of duplication has not been addressed | Change "one of the following conditions apply (see Table 26-4 (Settings for BW, RU Start Index, and RU End Index fields in HE NDP Announcement frame)):--- The RU End Index subfield in the Partial BW subfield is 8 and the bandwidth of the HE NDP Announcement frame is 20 MHz--- The RU End Index subfield in the Partial BW subfield is 17 and the bandwidth of the HE NDP Announcement frame is 40 MHz--- The RU End Index subfield in the Partial BW subfield is 36 and the bandwidth of the HE NDP Announcement frame is 80 MHz--- The RU End Index subfield in the Partial BW subfield is 73 and the bandwidth of the HE NDP Announcement frame is 80+80 MHz or 160 MHz"to"the RU End Index subfield in the Partial BW subfield is the value shown in Table 26-4 where partial bandwidth is not supported by the HE beamformer, for the bandwidth of the HE NDP Announcement frame." | Accepted |
| 20992 | 138.06 | 9.4.1.67 | "The HE CQI Report field contains information about the quality of the link." -- this is vague, compared to the CBR fields ("for use by a transmit beamformer to determine steering matrices Q"; "can be used by the transmit MU beamformer to determine the steering matrices Q") | Change "The HE CQI Report field contains information about the quality of the link." to "The HE CQI Report field contains information about the quality of the channel. This information can be used by an AP to determine RUs to use for DL OFDMA transmissions." | Rejected - the current description leaves open any intended usage of the CQI report, which is what was intended by the description. |
| 21002 | 356.10 | 26.7 | There are various issues with the description of HE sounding:- To avoid confusion between "addresses" in the context of the RA and in the context of a STA Info field's AID11, the latter should be referred to as "identifies" | As it says in the comment | Revised - agree with the comment.357.13 change "addressed to" to "identifying"357.19 change "addressed to" to "identifying"358.28 change "addressed to" to "identifies"358.64 change "addressed" "identified"359.11 change "addressed" to "identified"360.43 change "are addressed to" to "identify"360.48 change "addressed to" to "identifying"360.50 change "is directed to" to "identifies"360.61 change "address to" to "identifying"361.7 change "addressed by" to "identified by"361.18 change "addressed" to "identifed"361.20 change "addresses" to "identifies"361.20 change "addressed in" to "identified in"362.21 change "addressed to" to "identifying"362.25 change "addressed to" to "identifies"364.2 change "with a STA Info field addressed to it" to "with a matching STA Info field"364.5 change "with a User Info field addressed to it" to "with a matching User Info field"364.37 change "is addressed to" to "identifies"364.63 change "addressed to" to "identifying"365.5 change "addressed to" to "identifying"365.17 change "addressed to" to "identifying"365.23 change "addressed to" to "identifying"369.54 change "is addressed to" to "identifies"369.63 change "is addressed to" to "identifies" |
| 21013 | 356.10 | 26.7 | There are various issues with the description of HE sounding:- The wording for non-infrastructure BSSes is self-contradictory | Ensure the wording for non-infrastructure BSSes is not self-contradictory | Rejected - the comment does not identify a technical issue in sufficient detail. |
| 21014 | 356.10 | 26.7 | There are various issues with the description of HE sounding:- The requirement for each STA Info to identify a different STA should be taken out of Clause 9 (it's already in Clause 27) | Remove the material in Clause 9 that applies a requirement already stated in Clause 27 | Rejected - the comment does not identify a technical issue in sufficient detail. |
| 21016 | 356.10 | 26.7 | There are various issues with the description of HE sounding:- HE NDPAs can only be transmitted by HE STAs to HE STAs, so qualifiers like "to/from an HE beamformee" do not need to be constantly repeated (a single statement at the beginning suffices) | As it says in the comment | Rejected - the comment does not identify a technical issue in sufficient detail. |
| 21018 | 356.10 | 26.7 | There are various issues with the description of HE sounding:- It is not clear which of the various fields are N/A or ignored in which contexts | Add a table to show which fields are N/A or ignored in various contexts (SU/MU/CQI, TB/non-TB) | Rejected - the comment does not identify a technical issue in sufficient detail. |
| 21019 | 356.10 | 26.7 | There are various issues with the description of HE sounding:- Some of the wording needs caveats to allow for the case where a STA Info field is a fake that does not actually identify an actual STA | As it says in the comment | Rejected - the comment does not identify a technical issue in sufficient detail. |
| 21609 | 358.01 | 26.7.3 | HE MU sounding feedback can be obtained using HE TB sounding sequence. When UL MU is disabled by the non-AP STA, AP's DL MU-MIMO transmission can not be performed due to this constraint and this limitation contraints 11ax performance/gain. | Extend the paragraph as follows:An MU beamformer may solicit full bandwidth MU or CQI feedback from an MU beamformee in an HE non-TB sounding sequence ... | Rejected - the current text reflects what was decided in the task group. The requested addition of a new mode is considered to add complexity without sufficient technical justidication. (Copy of CID 15692, which was previously rejected. CID 16672 explicitly added that "An MU beamformer shall not solicit MU feedback in an HE non-TB sounding seqeunce.".) |
| 21615 | 356.50 | 26.7.2 | Please clarify when a 20MHz only STA is operating in the broadband OFDMA, can this STA use 80MHz NDP frame for sounding? If not, add spec support for it. | As stated in the comment. | Rejected - Table 26-4 specifies the permitted combinations of Operating channel width of the HE beamformee, Bandwidth of HE NDP Announcement frame and the sounded RUs (through the RU Start Index field and the RU End Index field). The permitted combinations can be inferred from it.  |