### IEEE P802.11Wireless LANs

|  |
| --- |
| **11ax D4.0 sounding comments** |
| Date: 2019-01-10 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Huizhao Wang | Quantenna |  |  | hwang@quantenna.com |
| Sigurd Schelstraete | Quantenna |  |  | sschelstraete@quantenna.com |
| Zhou Lan | Broadcom |  |  | zhou.lan@broadcom.com |
| Chunyu Hu | Broadcom |  |  |  |

Abstract

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

* CID List here: 20198, 20222, 20223, 20224, 20225, 20226, 21609, 21613

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Commenter | P.L | Clause | Comment | Proposed changes | Proposed resolution |
| 20198 | Chunyu Hu | 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 ... | Revised:Text changes are under CID 20198. |
| 20222 | Huizhao Wang | 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 " | Revised:Text changes are under CID 20222. |
| 20223 | Huizhao Wang | 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 soundingsequence. An MU beamformer may solicit partial bandwidth MU feedback from an MU beamformee inan HE TB or non-TB sounding sequence if the MU beamformee indicates support by setting the Triggered MU BeamformingPartial BW Feedback subfield to 1." | Revised:Text changes are under CID 20223 |
| 20224 | Huizhao Wang | 359.57 | 26.7.3 | Should allow SU beamformer to solicit partial BW feedback | Remove the paragraph of:"An HE beamformer shall not initiate an HE non-TB sounding sequence with an HE NDP Announcementframe that has a Partial BW Info field that indicates less than full bandwidth (see Table 26-4 (Settings forBW, RU Start Index, and RU End Index fields in HE NDP Announcement frame))." | Revised:Text changes are under CID 20224. |
| 20225 | Huizhao Wang | 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." | Revised:Text changes are under CID 20225. |
| 20226 | Huizhao Wang | 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 FeedbackType And Ng, Codebook Size and Nc subfields in the HE NDP Announcement frame to 0." | Revised:Text changes are under CID 20226. |
| 21609 | Zhou Lan | 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 ... | Revised:Text changes are under CID 21609. |
| 21613 | Zhou Lan | 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 SUfeedback 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. | Revised:Text changes are under CID 21613. |

**Revision log:**

R1: initial.

R2: fix header & footer

R3: revised to address CIDs filed against LB 238

R4: add 2 SPs

**Discussion:**

When stations have UL MU or UL MU Data or both disabled through OMI, AP is still allowed to send DL MU (OFDMA and MU-MIMO) to the stations. For DL MU-MIMO the precoding matrix is always required to cancel interferences, so AP will need to get MU sounding feedback from the stations even they have UL MU disabled, and the only way to get MU sounding feedback is to use non-TB sounding sequence and request for MU feedback.

The comments also point out that there is no relationship between TB or none TB sounding sequences and the requested feedback bandwidth (full or parial). And in none TB sounding sequence, beamformer may choose to provide feedback parameters: Ng, codebook, Nc, feedback type (SU/MU/CQI-Only) to beamformee; beamformee may choose to take these parameters to form feedback or ignor them and use its own configured parameters to form feedback.

***TGax editor: within TGax D4.0, in subclause 26.7.2 Sounding sequences and support, modify the text as shown:***

Page 356.36 change as shown:

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. Use of HE non-TB sounding does not necessarily imply SU feedback, HE non-TB sounding is also used to obtain MU feedback and CQI feedback. (CID 21613)

***TGax editor: within TGax D4.0, in subclause 26.7.2 Sounding sequences and support, modify the text as shown:***

Page 357.47 change as shown:

An SU beamformer may solicit full bandwidth SU feedback from an SU beamformee in an HE non-TB sounding sequence. An SU beamformer ~~shall not~~ may solicit partial bandwidth SU feedback in an HE TB sounding sequence or an HE non-TB sounding sequence,~~. An SU beamformer may solicit partial bandwidth or full bandwidth SU feedback from an SU beamformee in an HE TB sounding sequence~~ if the SU beamformee indicates support by setting the Triggered SU Beamforming Feedback subfield in the HE PHY Capabilities Information field in the HE Capabilities element it transmits to 1. (CID 20222, 20224)

***TGax editor: within TGax D4.0, in subclause 26.7.2 Sounding sequences and support, modify the text as shown:***

Page 357.55 change as shown:

An MU beamformer may solicit full bandwidth MU feedback from an MU beamformee in an HE TB sounding sequence or in an HE non-TB sounding sequence. An MU beamformer may solicit partial bandwidth MU feedback from an MU beamformee in an HE TB sounding sequence or in an HE non-TB sounding sequence if the MU beamformee indicates support by setting the Triggered MU Beamforming Partial BW Feedback subfield to 1. ~~An MU beamformer shall not solicit MU feedback in an HE non-TB sounding sequence.~~ (CID 20222, 20223, 20224)

***TGax editor: within TGax D4.0, in subclause 26.7.3 Rules for sounding protocol sequences, modify the text as shown:***

Page 359.57 change as shown:

~~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 27-4 (Settings for BW, RU Start Index, and RU End Index fields in HE NDP Announcement frame)).~~ (CID 20222, 20224)

Page 361.05 change as shown:

In an HE TB sounding sequence or an HE non-TB sounding sequence, each STA Info field in the HE NDP Announcement frame that solicits SU or MU feedback indicates the subcarrier grouping, *Ng*, codebook size and the number of columns, *Nc*, to be used by the HE beamformee addressed by the STA Info field for the generation of HE compressed beam-forming/CQI report carrying the SU or MU feedback. In an HE non-TB sounding sequence where the STA Info field in the HE NDP Announcement frame solicits SU feedback, the subcarrier grouping, *Ng*, codebook size and the number of columns, *Nc*, used for the generation of the HE compressed beamforming/CQI report carrying the SU feedback can be ~~are~~ determined by the HE beamformee. (CID 20198, 20225, 20226, 21609)

Page 362.20 change as shown:

In an HE non-TB sounding sequence or ~~, an HE beamformer shall solicit full bandwidth feedback. In~~ an HE TB sounding sequence, an HE beamformer shall solicit full bandwidth feedback in a STA Info field addressed to an HE beamformee that has not indicated support for partial bandwidth feedback. ~~In an HE TB sounding sequence, an~~ An HE beamformer may solicit full bandwidth or partial bandwidth feedback in a STA Info field addressed to an HE beamformee that has indicated support for partial bandwidth feedback (see 26.7.2 (Sounding sequences and support)).

(CID 20222, 20224)

Page 363.45 change as shown:

An HE beamformer soliciting SU feedback in an HE non-TB sounding sequence may ~~shall~~ set the Feedback Type And Ng, Codebook Size and Nc subfields in the HE NDP Announcement frame to 0. (CID 20225, 20226)

Straw Poll 1:

Do you agree the CR for CIDs (20198, 20223, 21609, 21613): allowing using non-TB sounding sequence to solicit MU feedback from non-AP STA?

Y/N/A:

Straw Poll 2:

Do you agree the CRs for CID (20222, 20224, 20225, 20226): allowing using non-TB sounding sequence to solicit partial BW SU feedback, beamformer suggesting sounding parameters to beamformee?

Y/N/A: