IEEE P802.11  
Wireless LANs

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| Sounding CRs 11ax Draft 5.0 | | | | |
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Abstract

This document contains sounding related comment resolutions for 802.11ax draft 5.0, addressing 14 CIDs

1. 22206 22208 22287 22289 22290 22305 22370 22373 22374 22388
2. 22389 22390 22395 22445

The baseline for this document is Draft P802.11ax D5.0.

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| **Identifiers** | **Comment** | **Proposed Change** | **Resolution** |
| CID 22206 9.3.1.19 110.21 Mark RISON | "If the AID11 subfield is not 2047, then it contains the 11 least significant bits of the AID of a STA expected to process the following HE sounding NDP and prepare the sounding feedback." -- not true for the other special AID11 values (0, 2045) | As it says in the comment | Revised - agree with the comment.  110.21 change  "then it contains the 11 least significant bits of the AID of a STA"  to  "contains an identifier of a STA that is" |
| CID 22208 9.3.1.19 111.38 Mark RISON | "The Disambiguation subfield is set to 1 to prevent a non-HE VHT STA from wrongly determining its AID in the HE NDP Announcement frame.  The Disambiguation subfield coincides with the MSB of the AID12 subfield of an expected VHT NDP Announcement frame if the HE NDP Announcement field is parsed by a non-HE VHT STA.  The MSB of the AID12 subfield is always 0 for a non-HE VHT STA due to the limitation of the AID to a maximum of 2007."  is a bit confusing, and is just informative anyway | Change the cited text to  "NOTE---The Disambiguation subfield is set to 1 to prevent a non-HE VHT STA from wrongly identifying its AID in an HE NDP Announcement frame.  The Disambiguation subfield coincides with the MSB of the AID12 subfield of a VHT NDP Announcement frame if the HE NDP Announcement field is parsed as VHT NDP Announcement frame by a non-HE VHT STA.  The MSB of the AID12 subfield is always 0 since the maximum AID is 2007." | Rejected - the cited text is indeed informative, but not confusing. |
| CID 22287 26.7 . Mark RISON | Duplication.  26.7.2 (Sounding sequences and support) says:  "An HE beamformer shall not send an HE NDP Announcement frame [if...]  - The Feedback Type And Ng subfield in the STA Info field indicates MU, the Codebook Size subfield in the STA Info field indicates codebook resolution (phi, psi) = {7, 5} and the Codebook Size (phi, psi) ={7, 5} MU Feedback subfield in the HE PHY Capabilities Information field is 0"  26.7.3 (Rules for HE sounding protocol sequences) says  "An HE beamformee may support a codebook size (phi, psi) = {7, 5} in the HE Compressed Beamforming Report field for MU feedback type.  A beamformer shall not request the codebook size (phi, psi) = {7, 5} in an HE NDP Announcement frame unless the beamformee indicates support for the Codebook Size (phi, psi) = {7, 5} MU Feedback subfield in the HE PHY Capabilities Information field in the HE Capabilities element it transmits (see 9.4.2.247 (HE Capabilities element))." | Delete the cited text in 26.7.3, and the para preceding it | Revised - agree with the comment.  The "may support" statements are already present in Table 9-321b (Subfields of the HE PHY Capabilities Information field)".  The "shall not" statements are already present in 26.7.2 (Sounding sequences and support).  Delete 376.52 through 377.7:  "An HE beamformee may support Ng = 16 in the HE Compressed Beamforming Report field for both SU and MU feedback types. A beamformer shall not request Ng = 16 for SU or MU feedback in an HE NDP Announcement frame unless the beamformee indicates support in the Ng = 16 For SU Feedback subfield or Ng = 16 For MU Feedback subfield, respectively, in the HE PHY Capabilities Information field of the HE Capabilities element it transmits (see 9.4.2.247 (HE Capabilities element)).  An HE beamformee may support a codebook size (ϕ, ψ) = {4, 2} in the HE Compressed Beamforming Report field for SU feedback type. A beamformer shall not request codebook size (ϕ, ψ) = {4, 2} in an HE NDP Announcement frame unless the beamformee indicates support in the Codebook Size (ϕ, ψ) = {4, 2} SU Feedback subfield in the HE PHY Capabilities Information field in the HE Capabilities element it transmits (see 9.4.2.247 (HE Capabilities element)).  An HE beamformee may support a codebook size (ϕ, ψ) = {7, 5} in the HE Compressed Beamforming Report field for MU feedback type. A beamformer shall not request the codebook size (ϕ, ψ) = {7, 5} in an HE NDP Announcement frame unless the beamformee indicates support for the Codebook Size (ϕ, ψ) = {7, 5} MU Feedback subfield in the HE PHY Capabilities Information field in the HE Capabilities element it transmits (see 9.4.2.247 (HE Capabilities element))." |
| CID 22289 26.7.3 . Mark RISON | "an individually addressed HE NDP Announcement frame with only one STA Info field that has a value in the AID11 field other than 2047"  is ambiguous: could mean  "contains a single STA Info field, and that STA Info field has a value in the AID11 field other than 2047; can't contain more than one STA Info field"  or  "there is only one STA Info field that has a value in the AID11 field other than 2047; can contain other STA Info fields (as long as they all have AID11 2047)" | Change the cited text to  "an individually addressed HE NDP Announcement frame with exactly one STA Info field that has a value in the AID11 field other than 2047" | Revised - agree with the comment.  374.28 change the cited text to  "an individually addressed HE NDP Announcement frame with a single STA Info field, the STA Info field having a value in the AID11 field other than 2047," |
| CID 22290 26.7.3 . Mark RISON | "an individually addressed HE NDP Announcement frame with only one STA Info field that has a value in the AID11 field other than 2047"  is ambiguous: could mean  "contains a single STA Info field, and that STA Info field has a value in the AID11 field other than 2047; can't contain more than one STA Info field"  or  "there is only one STA Info field that has a value in the AID11 field other than 2047; can contain other STA Info fields (as long as they all have AID11 2047)" | Change the cited text to  "an individually addressed HE NDP Announcement frame with exactly one STA Info field that has a value in the AID11 field other than 2047".  Make similar changes where needed elsewhere, e.g. in  "In an individually addressed HE NDP Announcement frame that has only one STA Info field with a value other than 2047 in the AID11 subfield, the Nc subfield is reserved."  in 9.3.1.19 (VHT/HE NDP Announcement) frame format and  "An HE beamformer that initiates the HE non-TB sounding sequence shall transmit the HE NDP Announcement frame with a single STA Info field that has a value in the AID11 field other than 2047"  in 26.7.3 | Revised - agree with the comment.  374.28 change the cited text to  "an individually addressed HE NDP Announcement frame with a single STA Info field, the STA Info field having a value in the AID11 field other than 2047,"  Note: same as CID 22289. |
| CID 22305 26.7 . Mark RISON | It is not sufficiently clear that a STAID of 2047 must only be present once (at the start) | In 26.7.2 Sounding sequences and support change  "An SU beamformer that includes a STA Info field with the AID11 subfield set to 2047 in an HE NDP Announcement frame shall place that STA Info field as the first STA Info field of the frame."  to  "An SU beamformer shall not place a STA Info field with the AID11 subfield set to 2047 in an HE NDP Announcement frame other than as the first STA Info field of the frame.".  In 26.7.3 Rules for HE sounding protocol sequences change  "When present, the STA Info field with AID11 value of 2047 shall be the first STA Info field in the frame."  to  "A STA Info field with an AID11 subfield value of 2047 shall not be anywhere other than the first STA Info field in the frame." | Revised - agree with the comment.  372.64 after  "An SU beamformer that includes a STA Info field with the AID11 subfield set to 2047 in an HE NDP Announcement frame shall place that STA Info field as the first STA Info field of the frame"  add  ", and shall not include more than one STA Info field with the AID11 subfield set to 2047".  376.4 after  "An HE beamformer that transmits an HE NDP Announcement frame may include a STA Info field with an AID11 subfield value of 2047 to indicate disallowed subchannels during punctured channel operation. When present, the STA Info field with AID11 value of 2047 shall be the first STA Info field in the frame."  add  "An HE beamformer that transmits an HE NDP Announcement frame shall not include more than one STA Info field with an AID11 subfield value of 2047." |
| CID 22370  . Mark RISON | CID 20612. The resolution claims that  "the definition of the SU Start Index field and the RU End Index field is clear that the field refers to the first and last 26-tone RU for which feedback is requested."  but this cannot be the case. For example, subcarriers -472 and -476 for 80M with Ng=4 are included both for RU index 0 and RU index 1, but RUs of a given size do not in fact overlap | Change  "RU Start Index"  to  "Subcarrier Start Index"  throughout and  "RU End Index"  to  "Subcarrier End Index"  throughout | Rejected - the RU to subcarrier mapping for the RU start index and the RU end index are defined in Tables 27-7, 8, and 9, as specified in 9.3.1.19 (VHT/HE NDP Announcement frame format).  RU to subcarrier mappings are defined in tables 27-7,8,9 and 9-93c,d. The two sets of tables serve different purposes. For partial BW sounding, Tables 9-93c,d specify the tones for which feedback is needed for that RU. But sometimes the required feedback tones for an RU are out of the tone range of that RU (as specified in 27-7,8,9), to ensure the channel interpolation / extrapolation quality. For example, for an RU26 using NG=4 feedback, sometimes there are 7 feedback tones within that RU and sometimes 8. To have consistent good channel interpolation / extrapolation quality, all 8 RU26 feedback tones (NG=4) are required, and some of the feedback tones are allowed to be outside of the actual RU used for the transmission. |
| CID 22373  . Mark RISON | CID 20675. The resolution says  "The HE equivalent does not provide more detail either.".  The proposed change referred to VHT, and the VHT equivalent does provide more detail:  "In a VHT Compressed Beamforming frame not carrying all or part of a VHT Compressed Beamforming report (see 10.36.5 (VHT sounding protocol) for a description of such a case)"  in 9.4.1.48 (VHT MIMO Control field) | Give an explanation or xref (as in the VHT equivalent) | Rejected - the comment does not identify a technical issue in sufficient detail. |
| CID 22374  . Mark RISON | CID 20675. The resolution says  "The HE equivalent does not provide more detail either.".  The proposed change referred to VHT, and the VHT equivalent does provide more detail:  "In a VHT Compressed Beamforming frame not carrying all or part of a VHT Compressed Beamforming report (see 10.36.5 (VHT sounding protocol) for a description of such a case)"  in 9.4.1.48 (VHT MIMO Control field) | Give an explanation or xref (as in the VHT equivalent). I think the VHT equivalent is referring to  "A VHT beamformee that transmits VHT compressed beamforming feedback(#1367) shall include neither the VHT Compressed Beamforming Report information and nor the MU Exclusive Beamforming Report information if the transmission duration of the PPDU carrying the VHT Compressed Beamforming Report information and any MU Exclusive Beamforming Report information would exceed the maximum PPDU duration."  but there may be other conditions in 10.36.5 | Rejected - the comment does not identify a technical issue in sufficient detail. |
| CID 22388  . Mark RISON | CID 20571. There are still far too many locations where the requirement for an AP that supports >= 4SS to support DL MU-MIMO is stated (search for "4 or more"):  4.3.15a (High efficiency (HE) STA)  Table 9-321b (Subfields of the HE PHY Capabilities Information field)  26.7.2 (Sounding sequences and support)  27.1.1 (Introduction to the HE PHY)  27.3.3.1.2 (Maximum number of spatial streams in an HE MU PPDU)  dot11HESUBeamformerOptionImplemented  (but ironically not dot11HEMUBeamformerOptionImplemented!) | Delete  "An HE AP that is capable of transmitting 4 or more space-time streams shall support DL MU-MIMO transmissions on full bandwidth."  in 27.3.3.1.2 (Maximum number of spatial streams in an HE MU PPDU) | Rejected - the comment does not identify a technical issue in sufficient detail. |
| CID 22389  . Mark RISON | CID 20571. There are still far too many locations where the requirement for an AP that supports >= 4SS to support DL MU-MIMO is stated (search for "4 or more"):  4.3.15a (High efficiency (HE) STA)  Table 9-321b (Subfields of the HE PHY Capabilities Information field)  26.7.2 (Sounding sequences and support)  27.1.1 (Introduction to the HE PHY)  27.3.3.1.2 (Maximum number of spatial streams in an HE MU PPDU)  dot11HESUBeamformerOptionImplemented  (but ironically not dot11HEMUBeamformerOptionImplemented!) | Delete most of the duplicate statements;  add a statement in the description of dot11HEMUBeamformerOptionImplemented | Rejected - the comment does not identify a technical issue in sufficient detail. |
| CID 22390 26.7.2 . Mark RISON | CID 20752. I see. OK, then that should be stated | After the third para of 26.7.2 Sounding sequences and support add a  "NOTE---A STA might use the setting of the MU Beamformer subfield to determine which AP to associate with." | Rejected - the comment does not identify a technical issue in sufficient detail.  Adding an example (as requested by the proposed resolution) is not solving a technical issue. |
| CID 22395 26.7.3 . Mark RISON | CID 20782. Resolution says  "the comment does not identify a technical issue in sufficient detail" -- I can't see how  "Saying reserved rather than 0 leaves options open for future expansion (forward-compatibility)"  is insufficiently detailed. Resolution also says  "Sometimes it is better to avoid that specific fields can all of a certain have different values."  but I can't work out what this mean (can all of a sudden? Still doesn't make sense) | In the referenced subclause change  "An HE beamformer soliciting SU or CQI 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."  to  "The Feedback Type And Ng, Codebook Size and Nc subfields in the HE NDP Announcement frame are reserved in an HE non-TB sounding sequence." | Rejected - the comment does not identify a technical issue in sufficient detail.  Specifying that a bit is 0 rather than reserved is not a technical issue, but a matter of policy. In this specific case, 0 was selected rather than reserved, and changing that at this time can cause interoperability issues later, which is a technical issue. |
| CID 22445 26.7.5 380.54 ron porat | "NUM\_STS indicates two or more space-time streams if the Feedback Type field in the HE MIMO Control field of the preceding HE NDP Announcement frame indicates either SU or MU. See below for additional constraints on NUM\_STS".  NUM\_STS can be 1 for CQI reporting mode | Update NUM\_STS range including CQI-only reporting scenario | Revised - agree with the comment.  At 380.55, after "either SU or MU" add  ", or one or more space-time streams if the Feedback Type field in the HE MIMO Control field of the preceding HE NDP Announcement frame indicates CQI" |