IEEE P802.11  
Wireless LANs

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| [CR for clause 36.3.3] | | | | |
| Date: 2020-02-26 | | | | |
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Abstract

This submission proposes resolutions for follwing 7 CIDs: 1307, 1308, 1329, 1554, 2788, 3155, and 3279. The proposed changes are based on IEEE 802.11be D0.3 [1].

Revisions:

* Rev 0: Initial version of the document.

## CID 1307, 1308, 1329, 1554, 2788, 3155, 3279

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1307 | 196.28 | 36.3.3 | This text is mostly good "The maximum total number of spatial streams (across all users) that is supported for the reception of an EHT  MU PPDU is indicated by TBD field in EHT PHY capabilities and its minimum value is 4." | Convert this text to black, except with 4 replaced by 8 or more | Revised  TGbe Editor: Incorporate the changes in https://mentor.ieee.org/802.11/dcn/21/11-21-0334-00-00be-CR for clause 36.3.3.docx |
| 1308 | 197.23 | 36.3.3 | The requireemnt "The number of total spatial streams (summed over all users) is less than or equal to 8" is weak since it diminishes the value of a 16SS AP since the AP cannot rely on clients being available | Change 8 to 16 | Rejected  The UL MU-MIMO is not beam-formed in R1, and the performance is heavily dependent on the MIMO detection algorithm at the RX side. It is reasonable to limit the total number of SS to 8. |
| 1329 | 196.31 | 36.3.3 | "An EHT AP with four or more antennas" should be more precise | Refer instead to "min(number of transmit chains, number of receive chains) of this link" since a) a dual/tri-band AP might have many antennas but only some are available to this link (yes it is implicit that this is talking about an "IEEE AP" not a "dual/tri-band HW AP" but given the "shall" statement here, greater clarity is preferred) and b) some APs have mulltiple antennas per TX/RX chain yet these offer no help towards more SS within MU-MIMO. Check all instances of "antenna" in clause 36, such as at P196L60, P355L61, P336L38, P343L59, P346L20, P316L40 (since, from Table 36-14, this is number of receive chains), and replace "antenna" as appropriate: "transmit chain", "receive chain", "input to a receive chain" or "output of a transmit chain" instead. Note that "antenna connector is a defined term and should not be changed. | Rejected  It is rejected for now, but open for further discussion. The number of TX chains can be different from the actual number of physical antennas, but the requirement of mandatory DL MU-MIMO is to have at least 4 physical antennas in this sentence, which can be controversial, because the actual number of TX chains can be much less than the number of antennas. This topic may impact on several other subclauses as well. *Available Spatial Streams* can be another good candidate to replace *antennas*. Open for further discussion. |
| 1554 | 196.29 | 36.3.3 | define the TBD | as in comment. | Revised  TGbe Editor: Incorporate the changes in https://mentor.ieee.org/802.11/dcn/21/11-21-0334-00-00be-CR for clause 36.3.3.docx |
| 2788 | 196.60 | 36.3.3 | "UL MU-MIMO transmissions on all ﾠRU/MRU sizes greater than or equal to 242-tones in the supported bandwidths.". 11ax only mentions full-BW UL MU-MIMO, not partial BW. | Reconsider definition of UL MU-MIMO. | Revised.  TGbe Editor: Incorporate the changes in https://mentor.ieee.org/802.11/dcn/21/11-21-0334-00-00be-CR for clause 36.3.3.docx |
| 3155 | 197.24 | 36.3.3 | A STA may not know the total spatial streams in UL MU-MIMO if it does not or cannot decode all the User fields in the Trigger frame.  What is really meant here is that the STA shall support transmitting EHT TB PPDU with max. 8 EHT-LTF symbols. | Add at P197L24  "- The number of EHT-LTF symbols is less than or equal to 8."  Also, the same sentence should be added for UL OFDMA as well, though I could not easily find a good spot. I.e., the 11be draft should say somewhere that  "An EHT non-AP STA shall support transmitting EHT TB PPDU with the number of EHT-LTF symbols less than or equal to 8." | Revised.  The addition of “The number of EHT-LTF symbols is less than or equal to 8” is distorting the original intention of the sentence. It is because the number of LTFs is de-coupled from the N\_SS in the EHT.  The sentence is revised in a way that made independent of the non-AP STA to accommodate the commenter’s opinion.  TGbe Editor: Incorporate the changes in https://mentor.ieee.org/802.11/dcn/21/11-21-0334-00-00be-CR for clause 36.3.3.docx |
| 3279 | 196.60 | 36.3.3 | define a new term of non-OFDMA UL MU-MIMO transmissions somewhere. If needed, full bandwidth non-OFDMA and punctured non-OFDMA as well. | as in comment | Revised.  TGbe Editor: Incorporate the changes in https://mentor.ieee.org/802.11/dcn/21/11-21-0334-00-00be-CR for clause 36.3.3.docx |

Propose :

***TGbe editor: please modify the senstence in P196L28 as follows and change the color of the sentence to Black***

The maximum total number of spatial streams (across all users) that is supported for the reception of an EHT MU PPDU is indicated by *Beamformee SS* subfield in EHT PHY capabilities and its minimum value is 4. (#1307, #1554)

***TGbe editor: please modify the senstence in P196L60 as follows***

An EHT AP with four or more antennas shall support non-OFDMA UL MU-MIMO transmissions on all RU/MRU sizes greater than or equal to 242-tones in the supported bandwidths*, where the* n*on-OFDMA UL MU-MIMO is an UL MU-MIMO transmission scheduled only through the spatial resources over the partial or entire BW.* (#2788, #3279)

***TGbe editor: please modify the senstence in P197L24 as follows***

A non-AP STA shall support transmitting an EHT TB PPDU using MU-MIMO where:

- The number of spatial streams allocated to the non-AP STA ranges from 1 to N, where N is the smaller of 4 and the maximum number of spatial streams supported by the non-AP STA for SU transmissions.

The number of total spatial streams (summed over all users) for the EHT TB PPDU across all the scheduled users using the MU-MIMO is less than or equal to 8. (#3155)

**References:**

**[1] 802.11be D0.3**