IEEE P802.11
Wireless LANs

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| Resolutions for Misselaneous LB 188 CIDs |
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Abstract

This document proposes resolutions for CIDs on P802.11ac/D3.0.

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| 6251 | 9.9 | 115 | 52 | T | Whether +HTC-HT is a prereq for +HTC-VHT is not clear | Clarify that a STA may support +HTC-VHT but not +HTC-HT. |

**Resolution**: Reject. This is clear from the existing text. There is no need to change.

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| 6174 | 9.28.3 | 138 | 54 | T | Two redundant paragraphs (line 54 and 64) | Remove the paragraph starting on line 54. |
| 6387 | 9.28.3 | 138 | 54 | T | Almost the same paragraphs at line 54 and 64. | remove paragraph starting at line 54 |
| 6827 | 9.28.3 | 138 | 63 | T | the same description has been expressed in above paragraph from line 54 of the same page | Remove this paragraph. |

**Resolution**: Agree

**Discussion**: The paragraph is in fact being repeated. We propose to delete the repeated paragraph

**Change**:

[*Note to editor: delete paragraph as follows*]

For unsolicited MFB that is not in the same PPDU as a VHT Compressed Beamforming frame, the N\_STS subfield of the MFB subfield of VHT variant HT Control field shall be set to an equal or smaller value than the RXVECTOR parameter NUM\_STS of the received PPDU from which the MFB parameters are estimated.

If the MFB requester sends MRQ in a VHT NDP Announcement frame, then the MFB responder shall include the corresponding MFB in (all of) the VHT Compressed Beamforming frame(s) that is/are the response to the same VHT NDP Announcement frame and NDP sequence.

~~If an unsolicited MFB is not in the same PPDU as a VHT Compressed Beamforming frame, the N\_STS subfield of the MFB subfield of VHT variant HT Control field shall be set to a value equal to or smaller than the RXVECTOR parameter NUM\_STS of the received PPDU from which the MFB parameters are estimated.~~

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| 6232 | 8.2.4.6.2 | 38 | 25 | T | Why would BW be reserved if unsolicited - it has a bearing on the link budget for the recommended MCS | Allow this to be used |

**Resolution**: Reject

**Discussion**: In the solicited case, MFB elements are computed based on the PPDU which carries the corresponding MRQ. For this reason, the (recommended) MCS, N\_STS etc contained in a solicited MFB should correspond to the bandwidth of the PPDU which carries the corresponding MRQ. Hence the value of the BW field is fixed and is not required to be signaled.

**Change**: No change.

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| 6323 | 22.3.11.1 | 261 | 11 | T | The definitions of SU-MIMO and MU-MIMO beamforming are inaccurate. First, the definitions do not show the MU feature of MU-MIMO beamforming. Second, the definitions do not mention that SU/MU-MIMO beamforming are MIMO techniques. | Suggest to separately define SU-MIMO and MU-MIMO beamforming, or modify this sentence as "SU-MIMO and MU-MIMO beamforming are MIMO techniques used by a STA (the beamformer) to steer signals using channel knowledge to improve PPDU reception at another STA (the beamformee) or multiple other STAs (the beamformees)." |

**Resolution**: Counter.

**Discussion**: Agree that SU/MU-MIMO definitions can be improved. We propose the text be changes as below.

**Change**:

[*Note to editor: change text as follows*]

SU-MIMO and MU-MIMO beamforming are techniques used by a STA (the beamformer), with multiple antennas, to steer signals using knowledge of the channel, to improve throughput. ~~PPDU reception at another STA (the beamformee)~~. With SUMIMO beamforming, all spatial streams in the transmitted signal are intended for reception at a single STA. With MU-MIMO beamforming, the space-time streams are divided between one or more STAs.

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| 6054 | 9.28.3 | 139 | 30 | T | "MRQ is discarded"Wrong tense. The choice to discard comes before sending & receiving the discard notificaiton. | replace "is" with "has been" |

**Resolution**: Agree

**Change**: as per comment.

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| 6050 | 9.28.3 | 138 | 37 | G | "and may additionally be based on other factors""other factors" is not defined, and therefore should not appear in a normative statement. | may -> might |

**Resolution**: Agree

**Change**: as per comment.

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| 6051 | 9.28.3 | 139 | 4 | T | "that is based on an SU or MU PPDU,"What does this condition tell me? Ah, I've got it, it is not based on a passing carrier pidgeon. | Either delete or replace with ", regardless of whether it is based on an SU PPDU or an MU PPDU," |

**Resolution**: Counter

**Discussion**: Agree that text can be written better. However proposed change is also confusing. We have proposed an anternate change below.

**Change**:

[*Note to editor: change text as follows*]

For an MFB (solicited or unsolicited) ~~that is based either on an SU or MU PPDU~~, if the N\_STS subfield is set to a smaller value than the RXVECTOR parameter NUM\_STS, the MFB responder shall estimate the recommended MCS under the assumption that the MFB requester will transmit the first *NSTS* space-time streams in the corresponding PPDU carrying MRQ.

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| 6053 | 9.28.3 | 139 | 29 | T | ", and can also send an MFB"Wrong conjunction. It either provides a response, or indicates that no response will be forthcoming, but not both. | replace "and can also" with "or can" |

**Resolution**: Agree

**Change**: as per comment.

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| 6052 | 9.28.3 | 139 | 27 | T | "NOTE 1--If a STA fails to respond immediately to an MRQ, it can send an unsolicited MFB to update the MFB which was computed based on the most recent PPDU matching the GID"This sounds like it is sending two MFBs, one to update another. | Replace cited text with: "NOTE 1--If a STA fails to respond immediately to an MRQ, it can send an unsolicited MFB, which is computed based on the most recent PPDU matching the GID" |

**Resolution**: Agree

**Change**: as per comment.

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| 6001 | 22.3.11.2 | 262 | 22 | T | For MU-MIMO, the V feedback has to fulfill a certain constraints for the AP to compute appropriate Q matrix. For example, V has to be a unitary matrix within the range of H. | Add informative text for this constraint. |

**Resolution**: Reject

**Discussion**: Since only compressed BF report is supported in 11ac, the V matrix fed back by the beamformee is always unitary. It is beyond the scope of the 11ac spec to put constraints on how beamformee computes the Q matrix based on V matrices.

**Change**: No change.

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| 6661 | 22.3.11.1 | 261 | 63 | T | ".. can be designedto reduce interference between the signals intended for different beamformees" or a beamformee group may be chosen based on traffic (QoS) and/or user scheduling algorithm, for example. | As in comment |

**Resolution**: Counter

**Discussion**: MU-MIMO user group selection is beyond the scope of the 11ac spec. Besides, this sentence is unnecessary as most instances beamformer will have channel information of >Nu users. Therefore we propose to remove the sentence.

**Change**:

The MU-MIMO steering matrix  can be determined by the beamformer using the beamforming feedback matrices for subcarrier *k* from beamformee *j*, *Vk,j,* and SNR information for subcarrier *k* from beamformee *j*, *SNRk,j*, where . The steering matrix that is computed (or updated) using new beamforming feedback matrices and new SNR information from some or all of participating beamformees might replace the existing steering matrix for the next MU-MIMO data transmission. ~~When there is feedback information from more than~~ *~~N~~~~u~~* ~~STAs available at the beamformer, the beamformer may choose a beamformee group of~~ *~~N~~~~u~~* ~~STAs for an MU transmission for which the steering matrix can be designed to reduce interference between the signals intended for different beamformees.~~ The beamformee group for the MU transmission is signaled using the Group ID field in VHT-SIG-A.

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| 6678 | 9.28.3 | 137 | 37 | T | Doesn't this paragraph repeat what already stated in the second byullet in previous pragraph? | remove redundancy |

**Resolution**: Reject

**Discussion**: The paragraph does repeat what has been said earlier but it provides additional information. Hence we propose to keep it.

**Change**: none

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| 6615 | 22.3.11.1 | 261 | 28 | T | Replace "transmit signal vector" with "combined transmit signal vector" | See Comment |

**Resolution**: Reject

**Discussion**: Sentence is accurate as it is. Unnecessary and confusing to use the word “combined”.

**Change**: No change.

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| 6616 | 22.3.11.4 | 262 | 44 | T | Use of "shall" looks more appropriate here | Change "group assignments have been established" with "group assignments shall have been established" |

**Resolution**: Accept

**Change**: as per comment.

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| 6824 | 9.28.3 | 138 | 31 | T | The statement "In an MFB response solicited by an MRQ that was carried in a VHT NDP Announcement frame, the MFB shall be computed based on the VHT NDP following the VHT NDP Announcement frame." was redundant with P137L10 " in the case of a VHT NDPAnnouncement carrying the MRQ, based on the subsequent VHT NDP......" | Remove this sentence. |

**Resolution**: Reject

**Discussion**: The sentence does repeat what has been said in the previous page. However the sentence does add context to adjacent paragraphs. So we recommend keeping it as it is.

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| 6826 | 9.28.3 | 138 | 54 | T | P138L43 states that "If the MFB is in the same MPDU as a VHT Compressed Beamforming frame", while P138L54 states that "For unsolicited MFB that is not in the same PPDU as a VHT Compressed Beamforming frame". Please clarify whether to use MPDU or PPDU to make the statements consistent. | Please clarify whether to use MPDU or PPDU to make both statements consistent. |

**Resolution**: Reject

**Discussion**: These sentences are consistent so there is no reason to change them.

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| 6681 | 9.28.3 | 139 | 27 | T | "NOTE 1--If a STA fails to respond immediately to an MRQ". Tehre is no such a requirement as immediate response to an MRQ, so there canno be a failure | chang to: "NOTE 1--If a STA does not respond immediately to an MRQ ... " |

**Resolution**: Reject

**Discussion**: “Immediate” does have a strict meaning with respect to solicited MFB i.e. when solicited MFB is sent in the same TXOP as the corresponding MRQ.

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| 6828 | 9.28.3 | 139 | 6 | T | It is not correct to use the variant "NSTS" here. The variant "NSTS" is defined in section 22.3.10.11.1 to indicates the number of space-time streams in a VHT SU PPDU. While here the intention is to indicate the value of N\_STS field in an MFB. | Replace "NSTS" with "N\_STS" and add clarification that "N\_STS is the value of N\_STS subfield". |
| 6829 | 9.28.3 | 139 | 8 | T | It is not correct to use the variant "NSTS,u" here. The variant "NSTS,u" is defined in section 22.3.10.11.1 to indicates the number of space-time streams for user u in a VHT MU PPDU. While here the intention is to indicate the value of N\_STS field in an MFB for user u. | Change to:"If the MFB is based on measurement to user u's streams in an MU PPDU, the first N\_STS space-time streams correspond to columns Mu + 1,..,Mu + N\_STS of the spatial mapping matrix Q, (Mu are defined in 22.3.10.11.1 (Transmission in VHT format)) and N\_STS is the value of N\_STS subfield". |

**Resolution**: counter

**Change**:

[*Note to editor: change text as follows*]

For an MFB (solicited or unsolicited) that is based on an SU or MU PPDU, if the N\_STS subfield is set to a value *NSTS* which is a smaller value than the RXVECTOR parameter NUM\_STS, the MFB responder shall estimate the recommended MCS under the assumption that the MFB requester will transmit the first *NSTS* space-time streams in the corresponding PPDU carrying MRQ. If the MFB is based on an SU PPDU the first *NSTS* space-time streams correspond to columns 1, ..., *NSTS* of the spatial mapping matrix *Q*. If the MFB is based on an MU PPDU, the first *NSTS* space-time streams correspond to columns *Mu*+1, ...,*Mu*+*NSTS~~,u~~* of the spatial mapping matrix *Q* (*Mu* ~~and~~ *~~N~~~~STS,u~~* ~~are~~ is defined in 22.3.10.11.1 (Transmission in VHT format)).

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| 6789 | 9.28.3 | 137 | 52 | T | It is a little uncertain in the description how to get average SNR value, between genemetric mean (summuation in decibels) and arithmetic mean (summation in original numbers). This uncertainty also lies in the description of SNR value in compressed V feedback. FYI, average SNR value for CSI (only in 11n) was derived by arithmetic mean. | clearer description is needed |

**Resolution**: Reject

**Discussion**: Text clearly describes that the average SNR is in fact the geometric mean.

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| 6484 | 9.9 | 116 | 3 | T | The terminology is variant, not format | Change "HT or VHT format" to "HT or VHT variant" |

**Resolution**: Agree

**Change**: as per comment.