IEEE P802.11
Wireless LANs

|  |
| --- |
| LB188 Clause 8 Comment Resolutions |
| Date: 2012-07-12 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Nihar Jindal | Broadcom Corp. |  |  | njindal@broadcom.com |
|  |  |  |  |  |

Abstract

This document proposes resolutions for the following CIDs: 6243, 6244, 6245, 6530, 6169, 6385, 6531, 6532, 6533, 6535, 6547, 6386, 6788

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6243 | Brian Hart | 8.4.1.48 | 57.57 | "Subcarriers 0, +-2, +-4 and +-128 are skipped" without explanantion whereas other nearby notes given explanations | "DC subcarriers ... are skipped"? Ditto P58L18 |  |

**Discussion:**

For other bandwidth modes, a note listing the skipped subcarriers (including an explanation) is provided for Ng=1, but no note is provided for Ng > 1 because the skipped subcarriers are the same. I suggest that the notes referred to in this comment (57.57 and 58.18) both be deleted because they are for Ng > 1, and a note for the corresponding Ng=1 case has already been given.

**Proposed Resolution:**

Delete notes on 57.57 and 58.18.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6244 | Brian Hart | 8.4.1.49 | 61.62 | "Spaced 2Ng apart" but near DC this is not true - e.g. -6,-4,-2-1,1,2,4,6 | "Typically spaced ..." | Accepted |

**Discussion:**

Commenter is correct.

**Proposed Resolution:**

Accepted.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6245 | Brian Hart | 8.4.1.49 | 62.50 | Now scidx has two definitions - in table 8-53g and in table 8-53j. Ambiguous | For SNR, use a different term - e.g. use sscidx in place of scidx in table 8-53i and j. Also, at the end of table 8-53i add a note "NOTE--sscidx(.) is defined in Table 8-53j" | Revised:  |

**Discussion:**

Commenter is correct, and a reader could be confused by the two defintisions of scidx, especially since they appear very close to one another.

**Proposed Resolution:**

Revised: Replace "scidx" with "ssidx" on 62.16, in table 8-53i, and in table 8-53j. Also, at the end of table 8-53i add a note at the bottom: "NOTE--sscidx(.) is defined in Table 8-53j"

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6530 | Sigurd Schelstraete | 8.4.1.48 | 53.64 | The dimensions of the channel are not N\_BFEE,RX x N\_BFER,TX. It should be N\_BFEE,RX x N\_BFER,N\_STS. | Change text accordingly |  |

**Discussion:**

Commenter is correct that the number of columns of H is equal to N\_STS of the corresponding NDP, and N\_STS is not necessarily equal to N\_BFER,TX.

**Proposed Resolution:**

Revised. Replace "N\_BFER,TX" with "N\_BFER,N\_STS" on 53.64, 54.4, and 54.12.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6169 | Youhan Kim | 8.4.1.48 | 53.53 | A STA may use only a portion of the antennas for transmission and/or reception | Change "antenna numbers" to "number of active antennas" or "number of enabled antennas". |  |
| 6385 | Allert Van Zelst | 8.4.1.48 | 53.53 | It may be that a beamformer at some point in time disables a number of TX antennas to be able to beamform to a client, therefore the relationship here is with respect to the active or enabled antennas | change "and antenna numbers on the beamformee and beamformer sides" to "and the number of active antennas on the beamformee and beamformer sides" or "and the number of enabled antennas on the beamformee and beamformer sides" |  |

**Discussion:**

Commenter is correct that antenna numbers is not precise when referring to the BFer in this sentence - N\_STS is the correct quantity.

**Proposed resolution:**

Change "Nc and Nr and antenna numbers on the beamformee and beamformer sides" to "Nc, Nr, number of beamformee antennas, and beamformer's choice of N\_STS on the NDP to which this VHT Compressed Beamforming frame corresponds to".

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6531 | Sigurd Schelstraete | 8.4.1.48 | 53.64 | "arbitrary diagonalization" is not precise enough | In order to work as described, the diagonalization should meet a number of constraints at least, e.g.:- C should be unitary- B should be diagonal with diagonal values in descending order |  |
| 6532 | Sigurd Schelstraete | 8.4.1.48 | 54.01 | Make it clear that "submatrix" means "selected columns" | Replace "V is a submatrix of C" with "V consists of a subset of the columns of C" |  |

**Discussion:**

The commenter is correct that the this description is not accurate. The matrix V, which is a subset of the columns of matrix C, needs to be unitary, but otherwise the matrix decomposition should be left unconstrained.

**Proposed resolution:**

Change "V is a sub-matrix of C" to "V consists of a subset of the columns of C with those columns being orthonormal" , and remove "diagonalizing" from 53.64.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6533 | Sigurd Schelstraete | 8.4.1.48 | 54.13 | Add clarifying text below formula on line 12 | Add:Nr = N\_BFER,N\_STSNc <= N\_BFER,N\_STS |  |

**Discussion:**

The relationship between Nr and N\_BFER,N\_STS and the limitation Nc <= Nr are explained in 9.31.5 (VHT Sounding Protocol). It seems more appropriate to leave those explanations in 9.31.5 since they are a property of the NDPA/NDP/FB sequence, instead of of the VHT Compressed Beamforming Report field.

**Proposed Resolution:**

Reject, or add a pointer to 9.31.5 e.g. after equation on 54.12 add "Rules governing the values of Nr, Nc, and N\_BFER,N\_STS are in the context of the VHT Sounding Protocol are explained in 9.31.5."

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6535 | Sigurd Schelstraete | 8.4.1.48 | 61.27 | Clarify "when the beamformer applies the matrix V" | Change "when the beamformer applies the matrix V" to "when the beamformer uses V or a subset of the columns of V as the beamforming steering matrix" |  |

**Discussion:**

It is not clear what the proposed change accomplishes.

**Proposed resolution:**

Reject

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6547 | Sigurd Schelstraete | 8.5.23.2 | 94.58 | The statement "No vendor-specific elements are present in a VHT Compressed Beamforming frame" has no value. As an informative statement, this is already obvious from the description above. It might be marginally more useful as a normative statement, but even then it is not clear why this should be stated here and not for any other frame. Its presence here and absence for other frames would imply this somehow only applies to the VHT Compressed Beamforming frame. | Remove the sentence. |  |

**Discussion:**

The commenter is correct that this sentence does not appear for other similar frames and does not provide any particular value.

**Proposed resolution:**

Accepted.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6170 | Youhan Kim | 8.4.1.49 | 61.50 | Delta SNR is a new feature in 11ac. | Change "and 20.3.12.3" to ",20.3.12.3 and 22.3.11", and describe how to use delta SNR in 22.3.11. |  |
| 6386 | Allert Van Zelst | 8.4.1.49 | 61.50 | Add a reference to 22.3.11, because I don't believe a clause 20 section describes what to do with the delta SNRs | add reference to 22.3.11 | above |

**Discussion:**

Commenter is correct that the usage of Delta SNR is not described in 20.3.12.3. 22.3.11 does expalin that the MU steering matrices can be based on V and the SNR information.

**Proposed resolution:**

Change

"The MU Exclusive Beamforming Report field is used by the VHT Compressed Beamforming report (see VHT Compressed Beamforming frame format) to carry explicit feedback information in the form of delta SNRs for use by a transmit MU beamformer to determine steering matrices Q, as described in 9.29.3 (Explicit feedback beamforming) and 20.3.12.3 (Explicit feedback beamforming)."

 to:

 "The MU Exclusive Beamforming Report field is used by the VHT Compressed Beamforming report (see VHT Compressed Beamforming frame format) to carry explicit feedback information in the form of delta SNRs. The information in the VHT Compressed Beamforming Report field and the MU Exclusive Beamforming Report field can be used by the transmit MU beamformer to determine steering matrices Q, as described in 9.29.3 (Explicit feedback beamforming), 20.3.12.3 (Explicit feedback beamforming), and 22.3.11 (SU-MIMO and MU-MIMO Beamforming)."

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 6788 | Minho Cheong | 8.4.1.48 | 61.23 | 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 MFB field. FYI, average SNR value for CSI (only in 11n) was derived by arithmetic mean. | clearer description is needed |  |

**Discussion:**

The current description of average SNR is: "The AvgSNRi in Table 8-53h (Average SNR of Space-Time Stream i subfield) is the sum of the values of SNR per tone (in decibels) divided by the number of tones represented. Each SNR value per tone in stream i (before being averaged) corresponds to the SNR associated with the column i of the beamforming feedback matrix V determined at the beamformee."

**Proposed resolution:**

Reject, or change text to "The AvgSNRi in Table 8-53h (Average SNR of Space-Time Stream i subfield) is the sum of the decibel-valued SNR per tone divided by the number of tones represented."