IEEE P802.11
Wireless LANs

|  |
| --- |
| Comment Resolution for Beamforming Report Field |
| Date: 2011-09-14 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Joonsuk Kim | Broadcom | 190 Mathilda Pl, Sunnyvale, CA 94086 | 4085433455 | joonsuk@broadcom.com |
|  |  |  |  |  |

Abstract

This document provides resolution for the comments listed below.

Notes on this document:

* Comments are from: 11-11-0907-07-00ac-tgac-d1.0-comments.xls.
* Comments refer to: Draft P802.11ac\_D1.0.pdf.

*CID 2160 and 3171*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2160 | 42.30 | 8.4.1.38 |  |  | It is not clear what is "feedback with BW=20MHz". Is it "the width of the channel in which a measurement was made"? Is it "the width of the transmission"? | Clarify it. |
| 3171 | 42.30 | 8.4.1.38 |  |  | be more specific about "feedback with BW=20MHz". | change to "feedback with Channel Width subfield of VHT MIMO Control field equal to 20 MHz". Do the same change for 40, 80, and 160 MHz |

Proposed Solution: Counter; It needs clarification and better to be in 9.30.5 as an operating rule

*Editor: Change line 30-39 in page 42 as follows:*

***When the BSS operates ~~operating~~ with a 40 MHz, 80 MHz, ~~and~~ or 160 MHz channel width, the subcarriers for which Compressed Feedback Beamforming Matrix subfield is sent in the* *Beamforming feedback ~~with~~ when the Channel Width subfield of the VHT MIMO Control field is equal to*** ***~~BW=~~20MHz correspond~~s~~ to the ~~tones~~subcarriers in the primary 20 MHz channel.***

***When the BSS operates ~~operating~~ with an 80 MHz, ~~and~~ or 160 MHz channel width, the subcarriers for which Compressed Feedback Beamforming Matrix subfield is sent in the* *Beamforming feedback ~~with~~ when the Channel Width subfield of the VHT MIMO Control field is equal to*** ***~~BW=4~~0MHz correspond~~s~~ to the ~~tones~~subcarriers in the primary 40 MHz channel.***

***When the BSS operates ~~operating~~ with an 80+80 MHz, ~~and~~ or 160 MHz channel width, the subcarriers for which Compressed Feedback Beamforming Matrix subfield is sent in the* *Beamforming feedback ~~with~~ when the Channel Width subfield of the VHT MIMO Control field is equal to*** ***~~BW=8~~0MHz correspond~~s~~ to the ~~tones~~subcarriers in the primary 80 MHz channel***

*CID 2279*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2279 | 42.61 | 8.4.1.39 | 2660 |  | More detail description is necessary Delta\_SNR on how to represent it with 4 bits. For example, if Delta\_SNR > 7 dB, it needs to represent it with 7. And if Delta\_SNR < -8dB, it should be -8 in the report field. | need to submit contribution |

Proposed Solution: Accept in Principle;

*Editor: Change Eq (7-1) in page 42 as follows:*

$∆SNR\_{k,i}=\left\{\begin{array}{c}min\left\{round\left(10log\_{10}\left(\frac{\left‖\left|H\_{k}V\_{k,i}\right|\right‖^{2}}{N}\right)-\overbar{SNR\_{i}}\right),7\right\} if 10log\_{10}\left(\frac{\left‖\left|H\_{k}V\_{k,i}\right|\right‖^{2}}{N}\right)\geq \overbar{SNR\_{i}}\\max\left\{round\left(10log\_{10}\left(\frac{\left‖\left|H\_{k}V\_{k,i}\right|\right‖^{2}}{N}\right)-\overbar{SNR\_{i}}\right),-8\right\} otherwise \end{array}\right.$

*CID 2267 and 3673*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2667 | 39.20 | 8.4.1.38 |  |  | Subcarriers +-25, +-53, +-89 and +-117 are also pilot subcarriers in 160 MHz. | Delete +-25, +-53, +-89 and +-117 from the list. Also, add +-25, +-53, +-89 and +-117 to the list of pilot subcarriers. |
| 3673 | 39.20 | 8.4.1.38 |  |  | Ns is 468, but the number of indices is 476, it seems that only 8 pilot tones are skipped whereas 160 MHz has 16 pilot tones. | Also skip [+/-25 +/-53 +/-89 +/-117] |

Proposed Solution: Accept in Principle; But better to describe in better way rather than state individual tone index. There was a suggestion to have a fomular to describe it more carefully, but it is hard to find an unified fomular for all BW cases. So propose it as follows

*Editor: Add following sentence at line 33 in page 37 (in the same paragraph)*

 *For each channel width, the subcarrier indices start from negative band edge tone index with increment of Ng up to negative DC edge tone index and resume from positive DC edge tone index with increment of Ng up to positive band edge tone index, where positive tone indices are symmetric pattern of negative tone indices around DC point. If there are some tone indices that are the pilot tones, those tone indices are removed.*

 *And change the Table 8-ac8 as follows (Only changes are in 160MHz, Ng=1 case)*

|  |
| --- |
| * Subcarrier for which a Compressed Beamforming Feedback Matrix subfield is sent back
 |
| Channel Width | *Ng* | *Ns* | Subcarriers for which Compressed Feedback Beamforming Matrix subfield is sent: *scidx*(0), *scidx*(1), …, *scidx*(*Ns*-1) |
| 160 MHz | 1 | 468 | -250, -249, -248, -247, -246, -245, -244, -243, -242, -241, -240, -239, -238, -237, -236, -235, -234, -233, -232, -230, -229, -228, -227, -226, -225, -224, -223, -222, -221, -220, -219, -218, -217, -216, -215, -214, -213, -212, -211, -210, -209, -208, -207, -206, -205, -204, -202, -201, -200, -199, -198, -197, -196, -195, -194, -193, -192, -191, -190, -189, -188, -187, -186, -185, -184, -183, -182, -181, -180, -179, -178, -177, -176, -175, -174, -173, -172, ***~~-171~~,*** -170, -169, -168, -166, -165, -164, -163, -162, -161, -160, -159, -158, -157, -156, -155, -154, -153, -152, -151, -150, -149, -148, -147, -146, -145, -144, -143, -142, -141, -140, -138, -137, -136, -135, -134, -133, -132, -131, -130, -126, -125, -124, -123, -122, -121, -120, -119, -118, -117, -116, -115, -114, -113, -112, -111, -110, -109, -108, -107, -106, -105, -104, -103, -102, -101, -100, -99, -98, -97, -96, -95, -94, -93, -92, -91, -90***, ~~-89~~***~~,~~ -88, -87, -86, -85, -84, -83, -82, -81, -80, -79, -78, -77, -76, -75, -74, -73, -72, -71, -70, -69, -68, -67, -66, -65, -64, -63, -62, -61, -60, -59, -58, -57, -56, -55, -54, ***~~-53~~,*** -52, -51, -50, -49, -48, -47, -46, -45, -44, -43, -42, -41, -40, -39, -38, -37, -36, -35, -34, -33, -32, -31, -30, -29, -28, -27, -26, ***~~-25,~~*** -24, -23, -22, -21, -20, -19, -18, -17, -16, -15, -14, -13, -12, -11, -10, -9, -8, -7, -6, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, ***~~25,~~*** 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52***, ~~53,~~*** 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88***~~, 89~~***, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, ***~~117~~,*** 118, 119, 120, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250NOTE—Pilot subcarriers (±231, ±203, ±167, ±139***, ±117, ±89, ±53, ±25***), DC subcarriers (0, ±1, ±2, ±3, ±4, ±5) and subcarriers ±127, ±128, ±129 are skipped. |

*CID 2797 and 2798*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2797 | 33.50 | 8.4.1.38 |  |  | The packing rules are not specified | Say something like "No padding is present between angles, even if they correspond to different subcarriers. The last angle is followed with zero pad to make the VHT Compressed Beamforming Report field an integer number of octets in size.". Perhaps an example could be given |
| 2798 | 43.14 | 8.4.1.39 |  |  | The packing rules are not specified | Say something like "No padding is present between delta SNRs, even if they correspond to different subcarriers.". Perhaps an example could be given |

Proposed Solution: Agree in principle. We can use similar sentences from 802.11n spec (7.3.1.29 in 802.11n-2009). For MU Exclusive Beamforming Report field, however, Delta-SNR for each subcarrier has 4 bits and Ns’ for all BW/Ng cases is even number, its size is always multiple of octets. So no need to add any sentence in 8.4.1.39

*Editor: Add following sentence at line 33 in page 37 (in the same paragraph)*

***No zero padding is present between angles and subcarriers in VHT Compressed Beamforming Report field, even if they correspond to different subcarriers. If the size of the Compressed Beamforming Report field is not an integral multiple of 8 bits, up to 7 zeros are appended to the end of the report to make its size an integral multiple of 8 bits.***

*CID 3358*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3358 | 32.40 | 8.4.1.37 |  |  | What is the beamformee flexibility in filling in the VHT MIMO Control? May it choose what values it wants to use for Nr? [For Nc only if SU or it doesn't have as many antennas as requested (9.30.5); yes for Grouping (8.4.1.38, 23.3.11.2), Codebook Info (23.3.11.2); no for Feedback Type (9.30.5), Channel Width (9.30.5).] | Clarify |

Proposed Solution: Disagree to change the spec;

Reason: Nc in the SU-type feedback frame can be chosen by the beamformee. Nc in the MU-type feedback frame is requested by the beamformer (see 8.3.1.11) in NDPA frame. It is already described in the spec.

 Nr in the feedback frame should be the same with the number of Tx antennas that were sent in the sounding frame; if not (in other words, if the beamformee choose Nr < the number of Tx antennas sounded), we should have another message which Tx antennas have been chosen by the beamformee, which the current spec does not support.

 And the beamformee can choose Ng (grouping) and Nb (Codebook info) in the feedback report frame, no matter it is SU or MU-type feedback. (See 22.3.11.2). Clarified again in 11-1196r0.doc

*CID 3670*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3670 | 33.18 | 8.4.1.37 |  |  | "In case of a VHT Compressed Beamforming frame not carrying the Compressed Beamforming Report field, the field is set to all ones." -> this option is not clear from 8.5.16.2 VHT Compressed Beamforming frame format. |  Add to 8.5.16.2 that the Compressed Beamforming Report field can be "not present". |

Proposed Solution: Disagree

Reason: We believe the current spec is clear to have an option that VHT Compressed Beamforming frame without Compressed report field if those information is not available for certain cases as described in 9.30.5. No need to add another subclause to describe it in section 8.

Duplicates:

 CID 2660 is a duplicate of CID 2279

 CID 2664 is a duplicate of CID 2238

 CID 3287 and CID 3288 are duplicates of CID 2797 and CID 2798

Withdrawn;

 CID 2003 by the commenter (Osama AboulMagd)

 Email from Osama:

From: Osama AboulMagd [mailto:Osama.AboulMagd@huawei.com]
Sent: Wednesday, September 07, 2011 10:42 AM
To: Joonsuk Kim
Subject: Re: Comment resolution CID 2003

 Hi Joonsuk,

Yes, I withdraw it.

Regards;

Osama.