IEEE P802.11
Wireless LANs

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| SA110 Reporting CID Resolutions |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Chris Beg | Cognitive Systems | 560 Westmount Road NorthWaterloo Ontario, Canada |  | chris.beg@cognitivesystems.com  |
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Abstract

This submission addresses SA110 CIDs: R1-6, R1-23, R1-25, R1-33

Revision history:

R0 – Initial version

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| R1-6 | 9.4.1.81.4 | 59.31 | The wording is very awkward: "For each pair of transmit chain and receive chain, the in-phase (real) component of the CSI is entered first and followed by the quadrature (imaginary) component of the CSI." | Rephrase the sentence to read: For each transmit chain and receive chain pair, the in-phase (real) component of the CSI is entered first and is followed by the quadrature (imaginary) component of the CSI." | RevisedIncorporate changes specified in 24/1788r0 (<https://mentor.ieee.org/802.11/dcn/24/11-24-1788-00-00bf-SA110_reporting_cid_resolutions.docx>). |

**Notes:**

* Support wording cleanup proposed by commenter.
	+ In referenced text, contribution [24-1306r1](https://mentor.ieee.org/802.11/dcn/24/11-24-1306-01-00bf-initial-sa-ballot-comment-resolutions-for-reporting-cids.docx) accepted CID 6054 which replaced “RX/TX antenna pair” with “pair of transmit chain and receive chain”.
* Looking at text in paragraph above, propose further cleanup.
	+ Replace RX/TX chain pair with “receive and transmit chain pair” to be consistent.
	+ Since He(*r*, *t*, *k*) indexes receive chain index before transmit chain index, suggest ensuring “receive” comes before “transmit”.

***TGbf Editor: Modify P58.24 to P58.35 in D5.0 as follows:***

The scaling and quantization is performed independently for each receive chain and transmit chain pair. The measured CSI begins with the set of scaling factors for each receive chain and transmit chain pair, which is a 12-bit positive scaling factor. If there is an odd number of scaling factors, then the set of scaling factors is followed by a 4-bit padding field.

For each receive chain and transmit chain pair, the real (*He*(*R*)(*r, t, k*)) component of the CSI is encoded in the first 8-bits and the imaginary ( *He*(*I*)(*r, t, k*)) component of the CSI encoded in the second 8-bits. This begins with the lowest frequency subcarrier and is repeated for each subcarrier. The number of subcarriers (NSC) included in the measured CSI is defined in Table 9-129l (Number of subcarriers as a function of bandwidth, puncturing, and Ng).

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| R1-23 | 11.55.1.2 | 137.29 | "A sensing STA that supports receiving five or more spatial streams shall support Ng=8 and may support Ng=16 in the Sensing Measurement Report frame that results from an SI2SR NDP, SR2SI NDP, or SR2SR NDP where the bandwidth is greater than or equal to 160 MHz." | Since support of 160 MHz is optional, I would put that as the part of the condition up front. As it is written you could read it that a STA shall ..suport 160 MHz. Honestly just adding a table would be easier. | RevisedIncorporate changes specified in 24/1788r0 (<https://mentor.ieee.org/802.11/dcn/24/11-24-1788-00-00bf-SA110_reporting_cid_resolutions.docx>). |

**Notes:**

* Reword sentence so all conditions are stated in the beginning (number of spatial streams and bandwidth) and the requirement is stated at the end.

***TGbf Editor: Modify P137.19 to P137.32 in D5.0 as follows:***

A sensing STA that supports receiving up to four spatial streams of an SI2SR NDP, SR2SI NDP, or SR2SR NDP shall support Ng = 4 and may support Ng = 16 in the resulting Sensing Measurement Report frame (see Table 9-129h (Sensing Measurement Report Control field definition)).

A sensing STA that supports receiving five or more spatial streams of an SI2SR NDP, SR2SI NDP, or SR2SR NDP where the bandwidth is less than or equal to 80 MHz shall support Ng = 4 and may support Ng = 16 in the resulting Sensing Measurement Report frame.

A sensing STA that supports receiving five or more spatial streams of an SI2SR NDP, SR2SI NDP, or SR2SR NDP of bandwidth greater than or equal to 160 MHz shall support Ng = 8 and may support Ng = 16 in the resulting Sensing Measurement Report frame.

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| R1-25 | 9.4.2.332 | 77.39 | "The BW field indicates the maximum bandwidth supported by the STA for the transmission of SI2SR NDPs, SR2SI NDPs, and SR2SR NDPs." What are SI2SR NDPs, SR2SI NDPs, and SR2SR NDPs, give a definition or reference? | As per comment | RevisedIncorporate changes specified in 24/1788r0 (<https://mentor.ieee.org/802.11/dcn/24/11-24-1788-00-00bf-SA110_reporting_cid_resolutions.docx>). |

**Notes:**

* The format of each NDP depends on the exchange type.
* Propose resolving comment by adding reference to the Sensing measurement exchange section.

***TGbf Editor: Modify P77.38 to P77.41 in D5.0 as follows:***

The BW field indicates the maximum bandwidth supported by the STA for the transmission of SI2SR

NDPs, SR2SI NDPs, and SR2SR NDPs during a Sensing measurement exchange (see 11.55.1.5 (Sensing measurement exchange)). The encoding of this field is given in Table 9-129j (BW field format).

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| R1-33 | 9.4.1.81.2.2 | 53.01 | explain the relationship between m(r,t) and y(r,t) in a example or remove bullet point (a) as m(r,t) is not used anywhere | as in comment | RevisedIncorporate changes specified in 24/1788r0 (<https://mentor.ieee.org/802.11/dcn/24/11-24-1788-00-00bf-SA110_reporting_cid_resolutions.docx>). |

**Notes:**

* A similar proposal was raised in [22/1543r2](https://mentor.ieee.org/802.11/dcn/22/11-22-1543-02-00bf-extra-normalization-before-csi-quantization.pptx).
* Prefer to remove bullet point (a) and reference to m(r,t), since the usage of the scale factor is clearly defined in equation 9-5c, 9-5d, and 9-5e.

***TGbf Editor: Modify P52.65 to P53.37 in D5.0 as follows:***

The number of receive chains is indicated by NRX and the number of transmit chains is indicated by NTX.

1. For a given tuple of receive and transmit chains, (*r*, *t*), the positive 12-bit scaling factor γ(*r*, *t*) (see 9.4.1.78.4 (Sensing Measurement Report field)) is selected to avoid overflow when scaling and quantizing the measured CSI using Equation (9-5b) and Equation (9-5c). The sensing receiver selects the exact value of the scaling factor, and the selection is left to implementation.



(9-5b)

* (9-5c)
* This calculation is performed for each tuple of receive and transmit chains, (*r*, *t*).
1. Each real and imaginary part of the CSI is scaled and quantized to 8 bits using Equation (9-5b) and Equation (9-5c), respectively.

**9.4.1.81.2.3 CSI decoding procedure**

The received encoded CSI is decoded as follows:

1. The received real and imaginary parts of the scaled and quantized CSI are decoded as a pair of 2s complement numbers and are combined to form the complex CSI, *He*(*r*, *t*, *k*).
2. Each CSI value is rescaled according to Equation (9-5d).

Hd(r, t, k) = γ(*r*, *t*) *He*(*r*, *t*, *k*) (9-5d)

**SP:**

Do you support the resolution to CIDs: R1-6, R1-23, R1-25, R1-33 from 11-24/1788r0 and incorporating the changes into the latest TGbf draft?