IEEE P802.11
Wireless LANs

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| LB189 D2.0 11af Comment Resolutions on Stream and Segment Parsers |
| Date: 2012-09-12 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Hongyuan Zhang | Marvell  | 5488 Marvell Ln, Santa Clara, CA 95054 | 408-222-1837 | hongyuan@marvell.com |
| Ron Porat | Broadcom | San Diego |  |  |
| Wookbong Lee | LGE | Korea |  |  |

*Abstract: Resolutions of D2.0 comments on MCS Table: CIDs 4, 8, 9, 16, 17, 265, 605, 657, 734, 765, 844, 845*

##### CIDs 8 (Stream Parser)

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| 8 | Hongyuan Zhang | 23.3.10.6 | 244.31 | In 22.3.10.6 (stream parser for 11ac), there is some special handling of the stream parser if NCBPS>Nblock.Nes.S, however this case will never be triggered in 11af (up to 4 streams). | Change to "...as described in 22.3.10.6 (Stream Parser), except that the special case where Ncbps>Nblock.Nes.S does not happen for any clause 23 rate" | **Rejected** |

**Discussions**: The special case is automatically excluded in 11af, where only up to 4 streams are allowed. Don’t need to explicitly mention it.

**Proposal: Reject CID 8.**

##### CIDs 4, 9, 16, 17, 265, 605, 657, 734, 765, 844, 845 (Segment Parser)

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| 4 | Hongyuan Zhang | 23.3.3 | 233.52 | Modes 2C, 2N, 4C, and 4N are new for 802.11, need new transmitter block diagrams for these modes | add diagrams for these new modes | **Revised** |
| 9 | Hongyuan Zhang | 23.3.10.9 | 245.01 | Frequency segment parser is missing, at least for 2N and 4N cases. It is also not clear where exactly the segment parsing happens. From the draft, it looks like the segment parsing happens right before IFFT, but the PHY introduction slides showed differently. Also it does not define how to do the parsing (round-robin or block-wise, etc) | Add a subclause describing 11af segment parser, will bring a proposal | **Revised** |
| 16 | Eldad Perahia | 23.3.10.7 | 244.36 | The useful aspect of the segment parser in 11ac is that it makes the 160 MHz and 80+80 MHz modes modular blocks of 80 MHz. We've lost that feature if the segment parser is not used in 11af. | include the segment parser | **Revised**. |
| 17 | Eldad Perahia | 23.3.10.7 | 244.36 | Does all modes of operation use an interleaver mean that the interleaver is used for LDPC? | do not use interleaver for LDPC | **Accepted** |
| 265 | Fei Tong | 23.3.10.7 | 244.36 | The second sentence is neither appropriate nor accurate, which causes confusion. For instance, LDPC does not use any interleaver. | change the text to "The segment parser is not used in Clause 23 as a single interleaver is used for BCC code irrespective of number of channel segments" | **Accepted** |
| 605 | James Miller | 23.3.10.7 | 244.36 | Keep segment parser the same as current 11ac. | Keep segment parser the same as current 11ac. | **Revised** |
| 657 | Tevfik Yucek | 23.3.10.7 | 244.36 | Sentence need minor change | Change sentence as "All modes of operation use a common interleaver". | **Accepted** |
| 734 | Joseph Kwak | 23.3.10.7 | 244.36 | Keep segment parser the same as current 11ac. | Keep segment parser the same as current 11ac. | **Revised** |
| 765 | Ronald Murias | 23.3.10.7 | 244.36 | Keep segment parser the same as current 11ac. | Keep segment parser the same as current 11ac. | **Revised** |
| 844 | Joseph Levy | 23.3.10.7 | 244.36 | Keep segment parser the same as current 11ac. | Keep segment parser the same as current 11ac. | **Revised** |
| 845 | Joseph Levy | 23.3.10.7 | 244.36 | There seems to be an inconsistent between parts of Clause 23:23.3.3 transmitter block diagram, and 23.3.4.5 which does not mention a segment parser. | Remove the inconsistency by specifying whether segment parser is included or not. | **Revised** |

**Discussions**: Refering to 802.11ac Draft 3.0 Figures 22-11, 22-12, 22-13, 22-14, and also the statement in clause 22.3.4.9.1 and 22.3.4.9.2 “**For a contiguous 160 MHz transmission, map each segment to the upper and the lower part of one IDFT. For a non-contiguous 80+80 MHz transmission, map each segment to the separate IDFT**.”, 11ac Tx diagrams use a single IDFT per Tx Chain in contiguous 160MHz transmission diagram, and uses two separate IDFT per Tx chain in non-contiguou 80+80MHz transmission diagram.

The difference on the over-the-air waveform between modes 2C and 2N, and between modes 4C and 4N, are similar to the difference between 11ac 160MHz and 80+80MHz. Therefore in 23.3.3, to follow the 11ac convention, it is clearer to draw new figures for the non-contiguous modes 2N and 4N using separate IDFT blocks, while resuing the 11ac 20/40/80MHz transmission diagrams for modes 1, 2C and 4C.

In modes 2C and 4C, all bits are jointly encoded and interleaved (BCC). In modes 2N, and 4N, the encoding and modulation process in the frequency domain are the same as modes 2C and 4C, except that the constellations in each transmit chain is parsed into two separate IDFT blocks. Note that the encoding flows of modes 2C/2N/4C/4N are different from 11ac 160MHz and 80+80MHz transmission flow, where there is a segment parser between the stream parser and BCC interleaver.

The interleaver is used only with BCC, and for LDPC a new joint tone mapper is defined in modes 2C, 2N, 4C, 4N.

**Proposal: Accept CIDs 17, 265, and 657, and revised for CIDs 4, 9, 16, 605, 734, 765, 844, and 845. The proposed editorial instructions are included in this document as shown below.**

*TGaf Editor: Pls modify 23.3.3 in page 233 lines 55~56 as below.*

**23.3.3 Transmitter block diagram**

~~Transmitter block diagrams for TVHT are the same as the VHT block diagrams in 22.3.3 (Transmitter block diagram) with TVHT replacing VHT while bandwidth should be corrected according to TVHT bandwidth.~~

The transmit process for the L-SIG and TVHT-SIG-A fields of a TVHT PPDU using one frequency segment is shown in Figure 22-5, with TVHT replacing VHT while bandwidth should be corrected according to TVHT bandwidth.

The transmit process for generating the TVHT-SIG-B field of a TVHT SU PPDU and TVHT MU PPDU using one frequency segment are shown Figure 22-6 and Figure 22-7 respectively, with TVHT replacing VHT while bandwidth should be corrected according to TVHT bandwidth.

The transmit process for generating the Data field of a SU PPDU in TVHT\_MODE\_1, or TVHT\_MODE\_2C, or TVHT\_MODE\_4C with BCC and LDPC encodings, using one frequency segment, are shown Figure 22-8 and Figure 22-9 respectively, with TVHT replacing VHT while bandwidth should be corrected according to TVHT bandwidth.

The transmit process for generating the Data field of a MU PPDU in TVHT\_MODE\_1, or TVHT\_MODE\_2C, or TVHT\_MODE\_4C with BCC and LDPC encoding is shown Figure 22-10, with TVHT replacing VHT while bandwidth should be corrected according to TVHT bandwidth.

Figure 23-1 and 23-2 show the transmit process for generating the Data field of a TVHT\_MODE\_2N or TVHT\_MODE\_4N SU PPDU with BCC and LDPC encoding, respectively.



**Figure 23-1—Transmitter block diagram for the Data field of a TVHT\_MODE\_2N or TVHT\_MODE\_4N SU PPDU with BCC encoding**



**Figure 23-2—Transmitter block diagram for the Data field of a TVHT\_MODE\_2N or TVHT\_MODE\_4N SU PPDU with LDPC encoding**

*TGaf Editor: Pls make the folloing changes in page 244 line 36:*

**23.3.10.7 Segment parser**

The segment parser as described in 22.3.10.7 is not used in Clause 23. All modes of operation use a~~n~~ common interleaver in the case of BCC, or use a common tone mapper in the case of LDPC.

*TGaf Editor: Pls make the following modifications in subclause 23.3.10.11.1 in page 246 line 35~36.*

**23.3.10.11.1 Transmission in TVHT format**

For TVHT transmissions, the signal from transmit chain *iTX*, 1 ≤ *iTX* ≤ *NTX* shall be as specified in Equation (22-94).

For TVHT\_MODE\_1 transmission, parameters shall be selected to be the same with 40 MHz VHT trans­mission as defined in 22.3.10.11.1 (Transmission in VHT format).

For multi-segment transmissions TVHT\_MODE\_2C and TVHT\_MODE\_4C, each frequency segment shall follow the waveform as described in Equation (22-94), and the data and pilot subcarriers are allocated to the IDFT block according to the subcarrier mapping as specified in Table 23-4 (Tone location) in consecutive order from the lowest subcarrier to the highest subcarrier.

For multi-segment transmissions TVHT\_MODE\_2N and TVHT\_MODE\_4N, each frequency segment shall follow the waveform as described in Equation (22-94), and the data and pilot subcarriers are allocated to the two IDFT blocks according to the subcarrier mapping as specified in ~~Equation (22-94) and~~ Table 23-4 (Tone location) in consecutive order from the lowest subcarrier to the highest subcarrier in each of the two frequency segments, the lower half of the subcarriers are mapped to the IDFT corresponding to the lower frequency segment, and the upper half of the subcarriers are mapped to the IDFT corresponding to the upper frequency segment.

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