IEEE P802.11
Wireless LANs

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| 11bd SA2 PHY Comment Resolutions |
| Date: 2022-07-25 |
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Abstract

This submission proposes resolutions for the following six comments received on several PHY subclauses for 802.11bd SA2 ballot:

* 6003, 6010, 6011, 6013, 6014

Revisions:

* r0: initial version

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| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** | **Resolution** |
| 6003 |   | 0.00 | Regarding CID #5045, the concern remains. The MIMO technology was introduced to the 802.11 spec in parallel with the 11p (OCB) development. For example, 11p only focused on the 11a waveform then. From the spec time line point of view, it is not clear if OCB can support MIMO. | Suggest adding a subclause or a paragraph to bridge how MIMO works in the OCB environment. For example, as a minimum, need to point out channel measurements while communicating in the OCB. | Revised11bd does not define explicit sounding protocol for OCB MIMO due to the short coherence time in vehicular channels. This is different from 11n/ac/ax SU MIMO. To clarify the OCB MIMO operation, one subclause is proposed to be added. TGbd editor: please make the changes as in <https://mentor.ieee.org/802.11/dcn/22/11-22-1193-00-00bd-11bd-sa2-phy-comment-resolutions.docx> |

*Discussions:*

In Clause 21 (VHT PHY) and 26 (HE PHY) of 802.11REVme 1.3, there is a corresponding subclause describing how a transmitter determines the beamforming matrix based on the channel sounding feedback. For an NGV transmitter, due to the doppler nature of vehicular environment, there is no explicit sounding protocol defined. So the PPDU steering is per each NGV transmitter’s implementation. Add a subclause in similar location in Clause 32 (NGV PHY) to clarify the NGV SU MIMO operation.

*TGbd editor: please add the following subclause after 32.3.9 (Data field) in 11bd D5.0:*

**32.3.9a SU-MIMO**

SU-MIMO is defined for an NGV transmitter to transmit two spatial streams to an NGV receiver to improve throughput. Both the transmitter and receiver are equipped with more than one antenna. Due to the fast-varying channel in the vehicular environment, there is no explicit sounding protocol defined for an NGV transmitter to obtain the channel information prior to the transmission. The steering matrix used by the transmitter is implementation specific.

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| 6011 | 32.3.8.3 | 93.24 | "N\_10MHz = 2, If dot11CurrentChannelWidth indicates 20 MHz" means that if the NGV STA is in 20 MHz operating mode, than the L-STF will always be transmitted over 20 MHz. I.e., NGV STA is prohibited from transmitting a 10 MHz NGV PPDU. Same issue for L-LTF, L-SIG, etc. | At P93L22, P94L6, P95L3, change"if dot11CurrentChannelWidth indicates 10 MHz"to"for 10 MHz PPDU"At P93L24, P94L8, P95L5, change"if dot11CurrentChannelWidth indicates 20 MHz"to"for 20 MHz PPDU" | Revised Agree with the commenter that dot11CurrentChannelWidth is an incorrect parameter to determine N\_10MHz. Need to be changed to the parameter that indicates the PPDU BW.TGbd editor: please make the changes as in <https://mentor.ieee.org/802.11/dcn/22/11-22-1193-00-00bd-11bd-sa2-phy-comment-resolutions.docx> |

Discussions:

In 802.11REVme, Clause 32 (HE PHY), the number of subchannels is defined based on TXVECTOR paramter

CH\_BANDWIDTH, which indicates the PPDU bandwidth. For spec consistency, propose to replace dot11CurrentChannelWidth with TXVECTOR parameter CH\_BANDWIDTH.



*TGbd editor: please make the following changes in P93L22 in 11bd D5.0.*

*TGbd editor: please make the following changes in P94L5 in 11bd D5.0.*

 is defined in 32.3.8.3 (L-STF definition)

*TGbd editor: please make the following changes in P95L1 in 11bd D5.0.*

 is defined in 32.3.8.3 (L-STF definition)

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| 6013 | 32.1.1 | 69.44 | DCM (MCS 15) is most useful for 1 SS. In case of 2 SS MCS15, the same data rate can be achieved using 1SS MCS0.Note that 2SS MCS15 is optional in 11ax, and 11be does not support 2SS MCS15 (MCS15 is restricted to 1SS only). | Restrict NGV-MCS 15 to 1SS only (remove NGV-MCS 15 from 2 SS). | RevisedThe original motion on DCM design (Motion #18 in 11-19/0514r14) does not specify the modes. Agree with the commenter that NGV-MCS15 with 2SS is not needed. Remove and modify the corresponding text related to NGV-MCS15 with 2SS.Additionally, notice that two MIBs, *dot11NGVDCMImplemented* and *dot11NGVMidambleRxMaxNSS,* are defined in 11bd to indicate DCM and Midmable support. However, since both features are mandatory for an NGV STA, propose to remove these two MIBs and related text. TGbd editor: please make the changes as in <https://mentor.ieee.org/802.11/dcn/22/11-22-1193-00-00bd-11bd-sa2-phy-comment-resolutions.docx> |

*TGbd editor: please make the following changes in Table 32-22 and Table 32-24 in 11bd D5.0*

Please remove the row of MCS15 in Table 32-22 (NGV-MCSs for 10 MHz, Nss = 2) and add value 15 to value 10-14 as the Reserved entry.

Please remove the row of MCS15 in Table 32-24 (NGV-MCSs for 20 MHz, Nss = 2) and add value 15 to value 10-14 as the Reserved entry.

*TGbd editor: please make the following changes in P125 in 11bd D5.0*

Please remove the two rows corresponding to *dot11NGVDCMImplemented* and *dot11NGVMidambleRxMaxNSS* in Table 32-19 (NGV PHY MIB attributes).

*TGbd editor: please make the following changes in P137L21 and P137L22 in 11bd D5.0.*

Dot11PhyNGVEntry ::= SEQUENCE

{

dot11NGVCurrentChannelWidth INTEGER,

dot11NGVCurrentPrimaryChannel Unsigned32,

dot11NGVCurrentSecondaryChannel Unsigned32,

dot11NGVDYN20MAllowed TruthValue,

}

*TGbd editor: please remove the definition of dot11NGVDCMImplemented and dot11NGVMidambleRxMaxNSS* *from P137L63 to P138L22 in 11bd D5.0.*

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| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** | **Resolution** |
| 6010 | 32.1.1 | 69.45 | Three LTF modes seems like an overkill. | Make NGV-LTF-1x optional. | RejectedEach LTF mode support one operation scenario (e.g. long range mode, normal operation mode, and high efficiency mode). 11bd does not define capability exchange between NGV STAs. To ease the OCB operation, all PHY modes are mandatory, except the modes that are highly tied to hardware capability, e.g. MIMO two spatial streams and 20 MHz support. Additionally, NGV-LTF-1x is similar to HE-LTF-2x, which is also mandatory for 11ax. State-of-art 802.11 device should have no difficulty to support the digital design. |
| 6014 | 32.1.1 | 69.52 | The NGV receiver procedure (P119L18) states that "the receiver \*may\* combine the currently received PPDU with the previously stored NON\_NGV\_10 PPDU". I.e., receivers are not required to combine the PPDUs when receiving repetitive NON\_NGV\_10 PPDUs. | Either \* Move "Repetitive NON\_NGV\_10 PPDU" from P69L52 to P69L65or \* At P69L52, change "Repetitive NON\_NGV\_10 PPDU" to "Transmission of repetitive NON\_NGV\_10 PPDU".Also make corresponding changes at P19L65. | RejectedIt is mandatory for an NGV STA to support both transmit and receive of a Repetitive NON\_NGV\_10 PPDU. An NGV STA can choose the receiving algorithm for a Repetitive NON\_NGV\_10 PPDU, e.g. combine all or some of the repetitive copies in the Repetitive NON\_NGV\_10 PPDU or not to combine. This is implementation choice. For either design, an NGV STA supports the receive of this PPDU format.  |