IEEE P802.11
Wireless LANs

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| Comment Resolution on MIMO BF |
| Date: 2018-11-13 |
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Abstract

This submission proposes resolution of comments on MIMO BF received from LB #234 (TGay Draft 2.0).

- 7 CID: 3385, 3454, 3386, 3387, 3233, 3456, 3621

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| **CID** | **Page Number** | **Line Number** | **Comment** | **Proposed Change** | **Resolution** |
| 3385 | 249 | 7 | In the MIMO BRP TXSS procedure, if the number of sectors for a pair of TX and RX DMG antennas that were received in the last Initiator/Responder BRP TXSS is larger than 16, the BRP frame sent during the feedback phase shall contain feedback for at least 16 received sectors for the pair of TX and RX DMG antennas. Otherwise, the BRP frame shall contain feedback for all the received sectors for the pair of TX and RX DMG antennas. | as per comment | Revised- |
| 3454 | 250 | 23 | "reciprocal MIMO phase shall be supported by all EDMGSTAs that are SU-MIMO capable'Need to add condition of 'Antenna Pattern Reciprocity=1' for both parties" | as in comment | Revised- |
| 3386 | 251 | 29 | The statement "If the initiator has antenna pattern reciprocity, the initiator may also reduce the number of TRN subfields required for receive AWV training to reduce the responder SMBT training time." is redundant since it talks about the same thing as the following note. | as per comment | Revised- |
| 3387 | 252 | 27 | The statement "If the responder has antenna pattern reciprocity, the responder may also reduce the number of TRN subfields required for receive AWV training to reduce the initiator SMBT training time." is redundant since it talks about the same thing as the following note. | as per comment | Revised- |
| 3233 | 255 | 11 | "for the responder link shall be determined in such a way that no transmit or receive AWV come from the same DMG antenna." -this sentence is obscure - not clear what should be avoided | Refer to spefic fields in the EDMG channel measurement feedback (or another packet) | Revised- |
| 3456 | 256 | 15 | shall indicate a unique dialog token'. Should the dialog token be the same as in MIMO BF setup frame sent by initiator? | change to 'shall indicate the same dialog token value as in MIMO BF setup frame from the initiator' | Revised- |
| 3621 | 261 | 26 | Initiator's role is described as the responder's role | Replace "by the responder" to "by the initiator" | Revised- |

**Discussion:** *None.*

**Propose:** Revised for CID 3385, 3454, 3386, 3387, 3233, 3456, 3621 per discussion and editing instructions in 11-18/1683r2.

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**10.43.9.2.2 SU-MIMO beamforming**

**10.43.9.2.2.2 SISO phase**

***TGay editor: Modify the two paragraphes D2.0 P249L1 as follows (#3385):***

In the BRP frame sent by the initiator during the feedback phase, the EDMG Sector ID Order subfield in the EDMG Channel Measurement Feedback element indicates AWV feedback IDs, TX antennas and RX antennas of all or a subset of sectors that were received in the Responder BRP TXSS. The BRP CDOWN subfield in the EDMG Channel Measurement Feedback element indicates BRP CDOWNs of the packets in which these sectors were received. The SNR subfield in the Channel Measurement Feedback element indicates the SNRs with which these sectors were received. If the number of sectors for a pair of TX and RX DMG antennas that were received in the responder BRP TXSS is larger than 16, the BRP frame shall contain feedback for at least 16 received sectors for the pair of TX and RX DMG antennas. Otherwise, the BRP frame shall contain feedback for all the received sectors for the pair of TX and RX DMG antennas. In the BRP frame sent by the responder during the feedback phase, the EDMG Sector ID Order subfield in the EDMG Channel Measurement Feedback element indicates AWV feedback IDs, TX antennas and RX antennas of all or a subset of sectors that were received in the Initiator BRP TXSS. The BRP CDOWN subfield in the EDMG Channel Measurement Feedback element indicates BRP CDOWNs of the BRP packets in which these sectors were received. The SNR subfield in the Channel Measurement Feedback element indicates the SNRs with which these sectors were received. If the number of sectors for a pair of TX and RX DMG antennas that were received in the initiator BRP TXSS is larger than 16, the BRP frame shall contain feedback for at least 16 received sectors for the pair of TX and RX DMG antennas. Otherwise, the BRP frame shall contain feedback for all the received sectors for the pair of TX and RX DMG antennas.

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**10.43.9.2.2.3 MIMO phase**

**10.43.9.2.2.3.1 General**

***TGay editor: Modify the paragraph D2.0 P250L23 as follows (#3454):***

The non-reciprocal MIMO phase shall be supported by all EDMG STAs that are SU-MIMO capable. The reciprocal MIMO phase shall be supported by all EDMG STAs that are SU-MIMO capable and have the Antenna Pattern Reciprocity subfield in the DMG Capabilities element set to 1.

**10.43.9.2.2.3.2 Non-reciprocal MIMO phase**

***TGay editor: Modify the paragraph D2.0 P251L29 as follows (#3386):***

…. The L-TX-RX subfield and the Requested EDMG TRN-Unit M subfield of the MIMO BF Setup frame shall indicate the number of TRN subfields requested for receive AWV training in the following responder SMBT subphase.

***TGay editor: Modify the paragraph D2.0 P252L9 as follows (#3456):***

The TA field and the RA field of the MIMO BF Setup frame shall be set to the MAC address of the responder and the initiator, respectively. The MIMO BF Setup frame shall indicate the same dialog token value in the Dialog Token field as in the MIMO BF Setup frame received from the initiator….

***TGay editor: Modify the paragraph D2.0 P252L27 as follows (#3387):***

…. The L-TX-RX subfield and the Requested EDMG TRN-Unit M subfield of the MIMO BF Setup frame shall indicate the number of TRN subfields requested for receive AWV training in the following initiator SMBT subphase.

***TGay editor: Modify the paragraph D2.0 P255L11 as follows (#3233):***

The $N\_{tsc}^{(I)}$ best transmit sector combinations (or equivalently $N\_{tsc}^{(I)}$ best TX-RX AWV configurations) for the initiator link and the $N\_{tsc}^{(R)}$ best transmit sector combinations (or equivalently $N\_{tsc}^{(R)}$ best TX-RX AWV configurations) for the responder link shall be determined in such a way that no transmit or receive AWV come from the same DMG antenna (i.e. a transmit sector combination indicated by a specific SISO ID subset in the EDMG Channel Measurement Feedback element comprises a single transmit sector for each of *N*TX TX DMG antennas and the corresponding receive sector combination comprises a single receive sector for each of *N*RX RX DMG antennas). The algorithms for determining the $N\_{tsc}^{(I)}$ best transmit sector combinations for the initiator link and for determining the $N\_{tsc}^{(R)}$ best transmit sector combinations for the responder link are implementation dependent.

**10.43.9.2.2.3.3 Reciprocal MIMO phase**

***TGay editor: Modify the paragraph D2.0 P256L13 as follows (#3456):***

The responder shall send a MIMO BF Setup frame a SIFS following the reception of the MIMO BF Setup frame from the initiator. The TA field and the RA field of the MIMO BF Setup frame shall be set to the MAC address of the responder and the initiator, respectively. The MIMO BF Setup frame shall indicate the same dialog token value in the Dialog Token field as in the MIMO BF Setup frame received from the initiator ....

***TGay editor: Modify the paragraph D2.0 P257L21 as follows (#3233):***

The $N\_{tsc}^{(I)}$ best transmit sector combinations (or equivalently $N\_{tsc}^{(I)}$ best TX-RX AWV configurations) for the initiator link shall be determined in such a way that no transmit or receive AWV come from the same DMG antenna (i.e. a transmit sector combination indicated by a specific SISO ID subset in the EDMG Channel Measurement Feedback element comprises a single transmit sector for each of *N*TX TX DMG antennas and the corresponding receive sector combination comprises a single receive sector for each of *N*RX RX DMG antennas). The determined $N\_{tsc}^{(I)}$ best transmit and receive sector combinations for the initiator link shall be treated as the $N\_{tsc}^{(R)}$ best receive and transmit sector combinations for the responder link, respectively, where $N\_{tsc}^{(I)}$ = $N\_{tsc}^{(R}$. The algorithm for determining the $N\_{tsc}^{(I)}$ best transmit sector combinations for the initiator link is implementation dependent.

**10.43.9.2.3 MU-MIMO beamforming**

**10.43.9.2.3.3.2 Non-reciprocal MIMO phase**

***TGay editor: Modify the sentence D2.0 P261L24 as follows (#3621):***

The TX Antenna Mask field of each EDMG BRP-RX/TX packet shall indicate the TX DMG antenna(s) which is being used by the initiator to transmit the EDMG BRP-RX/TX packet.