IEEE P802.11
Wireless LANs

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| Resolution of BF-related CIDs |
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Abstract

This submission proposes resolutions to BF-related CIDs.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1060 | 30.9.2.2.5 | 385.09 | Typo | "TRN-Unit are shall" should be replaced with "TRN-Unit shall" (delete "are") |

**Proposed resolution**: Accept

**Discussion:** With the accepted modification, text will read as follows: “The first P TRN subfields of each TRN-Unit ~~are~~ shall be transmitted using the same AWV as the preamble and Data field of the PPDU…”

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1062 | 30.9.2.2.5 | 385.15 | Paragraph in lines 15-22 mixes the definition of EDMG BRP-TX packets with that of EDMG BRP-RX/TX packets. Parameter N is defined for EDMG BRP-TX packets (and not BRP-RX/TX). Repetition parameter for EDMG BRP-RX/TX packets is "RX TRN-Units per Each TX TRN-Unit" (and not N). | See below. |
| 1329 | 30.9.2.2.5 | 385.16 | I think this text is confusing and it is wrong. In BRP-RX/TX packets the AWV stays constant for Q where Q is the RX TRN-Units per Each TX TRN-Unit field. N is used in TX packet with TRN unit N. | submission will be provided |
| 1970 | 30.9.2.2.5 | 385.16 | (Copy of 1329) |  |

**Proposed resolution**: Revised

**Modification:** Replace the paragraph in lines 15-22 with the following:

*For EDMG BRP-TX packets, for each TRN-Unit, the transmitter may change AWV at the beginning of each consecutive N repetitions out of the M repetitions of TRN subfields, where N is the value of the EDMG TRN-Unit N field in the EDMG-Header-A plus one. For EDMG BRP-RX/TX packets, the transmitter may change AWV once at the beginning of the last M TRN subfields of each TRN-Unit with the constraint that the same AWV configuration is used in the transmission of R TRN-Units, where R is the value of the RX TRN-Units per Each TX TRN-Unit field in the EDMG-Header-A plus one. Any transmit signal transients that occur due to TX AWV configuration changes at the beginning of a TRN subfield shall settle within 64Tc from the beginning of the TRN subfield.*

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1578 | 30.9.2.2.5 | 386.01 | Figure 159 (Structure of TRN field) need to be redrawn since BRP-TX, BRP-RX and BRP -RX/TX have different structure. | Structure of TRN field should be redrawn for each case(EDMG BRP-TX, EDMG BRP-RX, EDMG BRP -RX/TX) |
| 2104 | 30.9.2.2.5 | 386.01 | Figure 159 is only applicable for BRP-TX and BRP-RX/TX | Add a note to the Figure title that this figure is only for BRP-TX and BRP-RX/TX. And also add an additional figure that shows the structure of the TRN fields for BRP-RX |

**Proposed resolution**: Revised

**Modification:** Modify lines 2-3 of page 385 as follows:

*The TRN field enables transmit and receive AWV training by EDMG STAs. The TRN field has the same form ~~shown in Figure 159~~ for all EDMG PHY modes (EDMG control, EDMG SC, and EDMG OFDM). The TRN field structure of EDMG BRP-TX packets, of EDMG BRP-RX/TX packets, and of EDMG BRP-RX packets are shown in Figure 159, Figure 160, and Figure 161, respectively.*



**Figure 159 — TRN field structiure of EDMG BRP-TX packets**



**Figure 160 — TRN field structiure of EDMG BRP-RX/TX packets**



**Figure 161 — TRN field structiure of EDMG BRP-RX packets**

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| 1061 | 30.9.2.2.5 | 385.23 | Strengthen the EDMG BRP-RX definition | Replace "all TRN subfields shall be transmitted using the same AWV" with "all TRN subfields of all TRN-Units shall be transmitted with the same AWV." (Add "of all TRN-Units".) |

**Proposed resolution**: Agreed

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1838 | 30.9.2.2.5 | 385.24 | The text states each TRN-Unit shall have 10 TRN subfields. Clarify if the subfields are a maximum of 10, or a variable number of subfields. Figure 159 is appears to be variable. | Clarify text and correct Figure 159 to follow text. |

**Proposed resolution**: Rejected

**Discussion:** The source of confusion is Figure 159, which was broken down into three figures in the resolution of CIDs 1578 and 2104. As is now clearly shown in the proposed new figures, for EDMG BRP-RX packets, a TRN-Unit has 10 TRN subfields. For EDMG BRP-TX and EDMG BRP-RX/TX, a TRN-Unit has P+M TRN subfields.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 2326 | 30.9.2.2.5 | 385.25 | "The transmission of the TRN field starts with T repetitions of the TRN subfield' Subfield also has varying length and should be replaced by TRN\_basic such that the gap is constant" | change TRN subfield to TRN\_basic^i |

**Proposed resolution**: Rejected

**Discussion:** Substituting the TRN subfields at the start of the TRN field of EDMG BRP-TX and EDMG BRP-RX/TX packets with a different sequence would break a basic characteristic of the TRN field format which is that it is composed of multiple repetitions of the same basic “unit” (namely, the TRN subfield), possibly increasing implementation complexity/cost. As defined in D1.0, the value of T is chosen such that the data/TRN transition gap is the same for all Golay length values (which is reasonable given that the length of Golay sequences used in the TRN field does not impact the processing time of the data field). With the change proposed by the commenter, the data/TRN transition gap would also be made the same when the TRN field is transmitted with different numbers of transmit chains. This change assumes that this would be a desireable characteristic, but no justification is given. One may claim that an increase in the data/TRN transition gap would actually be desirable (for allowing more time for a receiver to complete data processing) when processing MIMO packets instead of SISO ones, for example.

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1330 | 30.9.2.2.5 | 385.37 | ":Following the transmission of all TRN-Units as indicated by the value of the EDMG TRN Length field, 37 there are P repetitions of the TRN subfield" - only in BRP-TX and BRP-RX-TX packet | Add the qualifyer "In BRP-TX and BRP-RX-TX packets" at the beginning of the paragraph |

**Proposed resolution**: Revised

**Modification:** Modify line 37, page 385 as follows:

*In EDMG BRP-TX and EDMG BRP-RX/TX packets, following ~~Following~~ the transmission of all TRN-Units as indicated by the value of the EDMG TRN Length field…*

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| 1688 | 30.9.2.2.5 | 387.06 | "In this case..." . Which case? Some text is missing here. | Add clarufying text |

**Proposed resolution**: Revised

**Modification:** Modify line 28, page 386 as follows:

~~In this case,~~ For EDMG BRP-TX packets in which the value of the EDMG TRN-Unit N field in the EDMG-Header-A is greater than 0, $a=0,1\cdots {\left(M×L\right)}/{N-1}$.

Modify line 6, page 387 as follows:

~~In this case,~~ For EDMG BRP-RX/TX packets, $a=0,1\cdots LC-1$.

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| 1895 | 10.36.11.4.2 | 139.30 | wrong article "to obtain AN TXOP" | modify text "to obtain A TXOP" |

**Proposed resolution**: Accepted

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1021 | 10.38.9.5.1 | 183.08 | Typo | Replace Nresp with Rresp. |
| 1685 | 10.38.9.5.1 | 183.08 | Instead of Nresp+ 1 should be Rresp+1 | Change Nresp to Rresp |
| 2007 | 10.38.9.5.1 | 183.08 | The parameter Nresp in "Nresp+1" should be Rresp. | Change Nresp to Rresp. |

**Proposed resolution**: Accepted

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| **CID** | **Clause** | **Page** | **Comment** | **Proposed change** |
| 1140 | 10.38.9.5.1 | 183.31 | In a MIMO BRP TXSS, in order to reduce the efforts of interoperability test, the EDMG BRP-TX packets shall be sent using multiple transmit chains simultaneously. | "change ""EDMG BRP-TX packets used in a BRP TXSS may be sent using multiple transmit chains simultaneously""to ""EDMG BRP-TX packets used in a BRP TXSS shall be sent using multiple transmit chains simultaneously""" |

**Proposed resolution**: Rejected

**Discussion:** The text referred to by the commenter is:

“If both initiator and responder of a BRP TXSS are SU-MIMO capable (as defined in 10.38.9.2.2.1), EDMG BRP-TX packets used in a BRP TXSS may be sent using multiple transmit chains simultaneously.”

In the BRP TXSS setup procedure, as defined in D1.0, the determination of whether the procedure is a SISO BRP TXSS or a MIMO BRP TXSS is up to the initiator (by using the TXSS-MIMO subfield in the EDMG BRP Request element within the BRP frame sent to start the procedure). To enable the commenter’s proposal, we could force TXSS-MIMO to be 1 when both STAs are SU-MIMO capable. However, I’m not certain whether that would be recommended. In the same way that two SU-MIMO capable stations may not always transmit data using multiple space-time streams (depending on channel conditions, for instance), forcing two SU-MIMO capable STAs to always perform the complete SU-MIMO BF training may cause unnecessary overhead.

It is important to keep in mind that, in addition to SU-MIMO BF training, BRP TXSS will also be used in other cases, auch as in channel bonding BF training. It is important to give some flexibility for the STAs to choose the appropriate BF procedure for different transmission scenarios.

**SP/M:** Do you accept the resolutions given in 18/0146r0 to the following CIDs: 1060, 1062, 1329, 1970, 1578, 2104, 1061, 1838, 2326, 1330, 1688, 1895, 1021, 1685, 2007, 1140?