IEEE P802.11
Wireless LANs

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| TRN Subfield Indexing for EDMG PPDUs |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Claudio da Silva | Intel |  |  | claudio.da.silva@intel.com |
| Carlos Cordeiro | Intel |  |  |  |
| Artyom Lomayev | Intel |  |  |  |
| Miki Genossar | Intel |  |  |  |
| Jonathan Kosloff | Intel |  |  |  |

Abstract

This document suggests text that clarifies the structure of the TRN field in EDMG PPDUs and of elemens related to EDMG BRP feedback.

**Change to the draft spec:** 30.9.2.2.5 (TRN field definition):

*Insert the following at the end of the subclause*

In EDMG BRP-TX packets, consecutive TRN subfields are transmitted using the same AWV if the value of the EDMG TRN-Unit N field in the EDMG-Header-A is greater than 0. In EDMG BRP-RX/TX packets, consecutive TRN-Units are transmitted with the same AWV. The concept of *AWV feedback ID* is defined to indicate TRN subfields transmitted with the same AWV in the feedback of measurements made with EDMG BRP-TX and EDMG BRP-RX/TX packets.

For EDMG BRP-TX and EDMG BRP-RX/TX packets, a TRN subfield with index *i* is defined as the (*i*+1)th TRN subfield transmitted in the TRN field of the packet, where *i*=0,1, …, (*M*×*L*) – 1, *M* is the value of the EDMG TRN-Unit M field in the EDMG-Header-A plus one, and *L* is the value of the EDMG TRN Length field in the EDMG-Header-A. The *P* TRN subfields at the start of each TRN-Unit transmitted with the same AWV are not indexed, where *P* is the value indicated by the EDMG TRN-Unit P field in the EDMG-Header-A of the packet.

An AWV feedback ID of value *a* indicates the TRN subfields transmitted with the (*a*+1)th AWV used in the transmission of the TRN field. 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 TRN subfield with index *i* shall have AWV feedback ID equal to:

$$a=\left⌊{i}/{N}\right⌋$$

where:

* *N* is the number of consecutive TRN subfields within a TRN-Unit that are transmitted with the same AWV configuration, which can be equal to 1, 2, 3, 4, or 8, as indicated by the EDMG TRN-Unit M and EDMG TRN-Unit N fields in the EDMG Header-A

In this case, $a=0, 1 \cdots {\left(M×L\right)}/{N}-1$.

For EDMG BRP-TX packets in which the value of the EDMG TRN-Unit N field in the EDMG-Header-A is equal to 0, *a*=*i* and *a*=0, 1, …, (*M*×*L*) – 1.  For EDMG BRP-RX/TX packets, a TRN subfield with index *i* shall have AWV feedback ID *a* equal to:

$$a=\left⌊{i}/{\left(C×M\right)}\right⌋$$

where:

* *M* is as defined above
* *N* is as defined above
* *C* is the value of the RX TRN-Units per Each TX TRN-Unit field in the EDMG-Header-A plus one
* *L* is as defined above

In this case, $a=0, 1 \cdots {L}/{C}-1$.

**Change to the spec (802.11-2016):** 9.4.2.130 (DMG Beam Refinement element)

*Change the 8th paragraph as follows*

If the EDMG Extension Flag field is set to 0, ~~Tt~~he BS-FBCK field indicates the index of the TRN-T field that was received with the best quality in the last received BRP-TX PPDU, where the first TRN-T field in the PPDU is defined as having an index equal to 1. ~~If the last received PPDU was not a BRP-TX PPDU, this field is set to 0.~~ If the EDMG Extension Flag field is set to 1, the BS-FBCK field indicates the AWV feedback ID of the TRN subfields transmitted with the same AWV that were received with the best quality in the last received EDMG BRP-TX packet or EDMG BRP-RX/TX packet as defined in 30.9.2.2.5 (TRN field definition). If the last received PPDU was not a BRP-TX PPDU, an EDMG BRP-TX packet or an EDMG BRP-RX/TX packet, this field is set to 0. The determination of best quality is implementation dependent.

*Change Table 9-235 as follows*

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| Subfield | Meaning |
| Number of Measurements | The definition of the Number of Measurements subfield depends on the value of the EDMG Extension Flag field. If the EDMG Extension Flag field is set to 1, the Number of Measurements MSB field is prepended to the Number of Measurements subfield to form a single Number of Measurements field of size 11 bits. Otherwise, the Number of Measurements MSB field is reserved.The Number of Measurements subfield indicates the number of measurements in the SNR subfield and the Channel Measurement subfield. If the EDMG Extension Flag field is set to 0, the number of measurements ~~It~~ is equal to the number of TRN-T subfields in the BRP-TX packet on which the measurement is based, or the number of received sectors if TXSS result is reported by setting the TXSS-FBCK-REQ subfield to 1. If the EDMG Extension Flag field is set to 1, the number of measurements is equal to the number of AWV feedback IDs present in the EDMG BRP-TX packet or EDMG BRP-RX/TX packet on which the measurement is based, or the number of received sectors if TXSS result is reported by setting the TXSS-FBCK-REQ subfield to 1.  |

**Change to the draft spec:** 10.38.7 (Beam tracking)

*Change the following paragraph in D0.3 as follows*

The beam tracking responder may append the feedback to any packet from the responder to the initiator. The initiator may allocate time for the feedback through a reverse direction grant, provided the reverse direction protocol is supported by both the initiator and responder. The feedback type shall be the same as the feedback type in the last BRP frame that was transmitted from the initiator to the responder with TX-TRN-REQ equal to 1. If the responder has never received a BRP frame from the initiator with TX-TRN-REQ equal to 1, the responder shall respond with all subfields of the FBCK-TYPE field equal to 0 and set the BS-FBCK field to the index of the TRN-T subfield that was received with the best quality if the measurements were performed with DMG PPDUs or to the AWV feedback ID corresponding to the TRN subfields transmitted with the same AWV that were received with the best quality if the measurements were performed with EDMG PPDUs.

**Change to the draft spec:** 10.38.9.5.2 (DMG antenna and TRN-Unit configuration during BRP TXSS)

*Change the following paragraph in D0.3 as follows*

The first TRN-Unit in an EDMG BRP packet used in a BRP TXSS may be used for the initiator and responder to switch DMG antennas and shall not be processed by the responder. Therefore, for EDMG BRP-TX packets transmitted during BRP TXSS, the value of the TXVECTOR parameter EDMG\_TRN\_LEN shall be set to k + 1, where k is the number of TRN-Units used for sector sweep. The TRN subfields that comprise the first TRN-Unit in EDMG BRP-TX packets used in BRP TXSS shall not be included in the TRN subfield and AWV feedback ID indexing procedures described in 30.9.2.2.5 (TRN field definition).

**References:**