IEEE P802.11
Wireless LANs

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| Resolution of some preamble comments |
| Date: 2017-11-05 |
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Abstract

This document proposes resolutions to CID 97, 290, 405, 416, 417, 418, 419, 420, and 519.

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| CID | Clause | Comment | Proposed Change |
| 11 | 30.3.3.2.6 | Specify/clarify L-Header spoofing duration requirements for A-PPDUs. The L-Header spoofing duration for EDMG PPDUs described in section 30.3.3.2.6 seem to be specified w.r.t a single PPDU. There is an inherent challenge in determining the L-Header spoofing duration for an A-PPDU | Clarify whether the text in this section w.r.t L-Header spoofing duration applies only to a single PPDU. And also clarify what the requirements are for A-PPDUs |

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| Covered by 11-17/1676  | „Comment Resolution on CID11“ |

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| CID | Clause | Comment | Proposed Change |
| 97 | 30.3.3.3.2.3 | We should remove the term "channel estimate smoothing is recommended" and instead use "beamforming is applied". In this spec, we have not defined how/when channel smoothing should be used. In 802.11n (i.e. HT), we had a smoothing bit that should be set to 1 when 95% of the channel energy was within 800ns. | As in comment |

Proposed resolution: Revised

1. —EDMG-Header-A field structure and definition for a SU PPDU

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| **Field** | **Number of bits** | **Start bit** | **Description** |
| SU/MU Format | 1 | 0 | Indicates whether the PPDU is a SU PPDU or a MU PPDU. Set to 0 to indicate a SU PPDU and set to 1 otherwise. |
| Channel Aggregation | 1 | 1 | Set to 0 to indicate that the BW field specifies a 2.16 GHz, 4.32 GHz, 6.48 GHz or 8.64 GHz channel PPDU. Set to 1 to indicate that the BW field specifies a 2.16+2.16 GHz or 4.32+4.32 GHz PPDU. |
| BW | 8 | 2 | A bitmap constructed from the CH\_BANDWIDTH parameter in the TXVECTOR and that indicates the 2.16 GHz channel(s) over which the PPDU is transmitted on. If a bit is set to 1, it indicates that the corresponding channel is used for the PPDU transmission; otherwise if the bit is set to 0, the channel is not used. Bit 0 corresponds to channel 1, bit 1 corresponds to channel 2, and so on. |
| Primary Channel Number | 3 | 10 | Contains the 3 LSBs of the primary channel number of the BSS minus one |
| Beamformed | 1 | 13 | Set to 1 to indicate that digital beamforming is applied~~channel estimate smoothing is recommended~~. Set to 0 otherwise. |
| Short/Long LDPC | 1 | 14 | Indicates the LDPC codeword length used in the PSDU. Set to 0 for LDPC codeword of length 672. Set to 1 for LDPC codeword of length 1344. |

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| CID | Clause | Comment | Proposed Change |
| 290 | 30.3.3.3.2.3 | Number of SS field defined in EDMG-Header-A. Howerver, in channel aggregation, there is not explicit text about how to interpreate number of SS in receiver | "If different number of SS per aggregated channel is supported in 11ay,Modify the number of SS field in the EDMG-Header-A for SU PPDU when channel aggregation is used based on Motion 122 [11-16/1288r10].If different number of SS per aggregated channel is not supported in 11ay,If channel aggregation is used, the number of SS field in the EDMG-Header-A indicates the number of SSs of primary channel. The number of SSs of secondary channel is same as primary channel" |

Proposed resolution: Reject

Discussion:

The commenter addresses how to signal number of spatial streams in channel aggregation.

D0.8 holds the following statement for headers in EDMG control, SC, and OFDM mode:

“For 2.16+2.16 GHz and 4.32+4.32 GHz PPDU transmission, the number of spatial streams, NSS, shall be an even number. The first NSS/2 spatial streams shall be transmitted in the primary channel and the second NSS/2 spatial streams shall be transmitted in the secondary channel.”

We believe no further action needs to be done, although the solution is different from what the commenter proposed.

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| CID | Clause | Comment | Proposed Change |
| 405 | 30.3.3.2.6 | If N is the lowest 2.16GHz channel number over which the PPDU is transmitted, how can a control PPDU be sent on channel N+1 (or N+2, N+3, N+2+N+3) only? | Revise the table to be consistent with the definition of N |

Proposed resolution: Revised.
Comment is fixed by 11-17/1410 “Channel BW field definition”

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| CID | Clause | Comment | Proposed Change |
| 416 | 30.3.3.1 | The pre-EDMG modulated fields when transmitted on each secondary channel shall have a relative delay14 with respect to the corresponding fields transmitted over the primary channel that is between zero15 (inclusive) and Tc (inclusive), where Tc=1/1.76 GHz. The relative delay applicable to each secondary16 channel transmission may be different from each other, so long as it follows the aforementioned rule. In the second statement, how does each secondary channel know its relative delay ? | Discuss method to show (a) if delay In secndary channel (b) relative delay used. |

Proposed resolution: Reject.

It is not mentioned why a signaling of the relative delay for secondary channels is required. Resulting phase shift can be estimated by CEF and removed by the equalizer for example.

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| CID | Clause | Comment | Proposed Change |
| 417 | 30.3.3.3.2.1 | """U, but are different than13 the definition for EDMG control mode PPDUs"".Does not capture difference for SU and MU (FDMA vs non-FDMA)." | Discuss difference for SU and MU (FDMA/non-FDMA) |

Proposed resolution: Obsolete.

Work on MU-FDMA is not continued further. See CID 337.

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| CID | Clause | Comment | Proposed Change |
| 418 | 30.3.3.3.2.3 | Why does the EDMG MU PPDU of non-FDMA subtype not support beam tracking. DMG supports tracking for all PPDUs. | add support for beam tracking to non-FDMA subtype |

Proposed resolution: Reject.

Discussion

The commenter asks for beam tracking support in MU PPDUs. It is not specified how this is to be implemented.

Beam tracking is not only specified by a signalling in a header but it requires also changes or additions to the beam tracking procedure.

For this reason, the comment is non-actionable. However, the commenter is encouraged to bring a proposal to the Task Group to address the issue raised.

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| CID | Clause | Comment | Proposed Change |
| 419 | 30.3.3.3.2.3 | Why does the EDMG-Header-A field for an EDMG MU PPDU of FDMA subtype not support beam tracking. DMG supports tracking for all PPDUs. | add support for beam tracking using reserved bits |

Proposed resolution: Obsolete.

Work on MU-FDMA is not continued further. See CID 337.

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| CID | Clause | Comment | Proposed Change |
| 420 | 30.3.3.3.2.3 | "Consistency is needed in Table 16 on whether to indicate the TXVECTOR mapped to the specific parameter. For example, ""EDMG BeamTrackingRequest: Corresponds to the TXVECTOR parameterEDMG\_BEAM\_TRACKING\_REQUEST"". However, EDMG TRNLength has no similar sentence" | add corresponding TXVECTOR to all parameters |

Proposed resolution: Revised.

Discussion:

Header tables typically hold TXVECTOR correspondence. We should do it same way for 11ay. Some parameters are missing in TXVECTOR and RXVECTOR. Those should be added as well. In 11-17/1180r2 the following parameters have been already defined:

STBC, NUM\_STS, NUM\_USERS, and NUM\_TX.

30.2.2 TXVECTOR and RXVECTOR parameters

The parameters in Table 8 are defined as part of the TXVECTOR parameter list in the PHY-TXSTART.request primitive and/or as part of the RXVECTOR parameter list in the PHY-RXSTART.indication primitive.

1. —TXVECTOR and RXVECTOR parameters

| Parameter | Condition | Value | TXVECTOR | RXVECTOR |
| --- | --- | --- | --- | --- |
| FORMAT |  | Determines the format of the PPDU.Enumerated type:NON\_EDMG indicates Clause 20 or non-EDMG duplicate format. In this case, the modulation is determined by the NON\_EDMG\_MODULATION parameter.EDMG indicates EDMG format. | Y | Y |
| NON\_EDMG\_MODULATION | FORMAT is NON\_EDMG | In TXVECTOR, indicates the format type of the transmitted non-EDMG PPDU.In RXVECTOR, indicates the estimated format type of the received non-EDMG PPDU.Enumerated type:C\_MODE indicates Clause 20 control mode formatSC\_MODE indicates Clause 20 SC mode formatNON\_EDMG\_DUP\_C\_MODE indicates non-EDMG duplicate format | Y | Y |
| Otherwise | Not present | N | N |
| L\_LENGTH | FORMAT is NON\_EDMG | Indicates the length of the PSDU in octets in the range of 1 to 262 143. This value is used by the PHY to determine the number of octet transfers that occur between the MAC and the PHY. | Y | Y |
| Otherwise | Not present | N | N |
| L\_MCS | FORMAT is NON\_EDMG | Indicates the MCS used to transmit the PSDU as defined in Clause 20. | Y | Y |
| Otherwise | Not present | N | N |
|  | ***Editor Note: Need to add all DMG parameters from Table 20-1. EDMG parameters start from here.*** |  |  |  |
| EDMG\_TRN\_LEN | FORMAT is EDMG | Indicates the number of TRN-Units in the TRN field of a PPDU. Values are in the range 0–255 (see 30.9.2.2.5). | Y | Y |
| RX\_TRN\_PER\_TX\_TRN | FORMAT is EDMG | Indicates the number of consecutive TRN-Units in which the same AWV is used in the transmission of the last M TRN subfields of each TRN-Unit. Values are in the range 0–255.The parameter is valid only when the EDMG\_PACKET\_TYPE is TRN-R/T-PACKET and EDMG\_TRN\_LEN is greater than 0. | Y | Y |
| EDMG\_TRN\_P | FORMAT is EDMG | Indicates the number of TRN subfields at the beginning of a TRN-Unit which are transmitted with the same AWV. Values are in the range 0 to 3.The parameter is reserved if TRN-LEN is 0. The parameter is reserved if EDMG\_PACKET\_TYPE is TRN-R-PACKET. | Y | Y |
| EDMG\_TRN\_M | FORMAT is EDMG | If EDMG\_PACKET\_TYPE is TRN-T-PACKET, indicates the number of TRN subfields in a TRN-Unit in which the transmitter may change AWV at the beginning of each TRN subfield transmission. If EDMG\_PACKET\_TYPE is TRN-R/T-PACKET, indicates the number of TRN subfields in a TRN-Unit transmitted with the same AWV following a possible AWV change. Values are in the range 0 to 15.The parameter is reserved if TRN-LEN is 0. The parameter is reserved if EDMG\_PACKET\_TYPE is TRN-R-PACKET. | Y | Y |
| EDMG\_TRN\_N | FORMAT is EDMG | Indicates the number of consecutive TRN subfields within the EDMG TRN-Unit M of a TRN-Unit which are transmitted using the same AWV. Values are in the range 0 to 3.The parameter is valid only when the EDMG\_PACKET\_TYPE is TRN-T-PACKET and EDMG\_TRN\_LEN is greater than 0. | Y | Y |
| TRN\_SEQ\_LENGTH | FORMAT is EDMG | Indicates the length of the Golay sequence to be used to transmit the TRN subfields present in the TRN field of the PPDU. Enumerated Type:* Normal: The Golay sequence has a length of 128×*NCB*.
* Long: The Golay sequence has a length of 256× *NCB*.
* Short: The Golay sequence has a length of 64× *NCB*.

*NCB* represents the integer number of contiguous 2.16 GHz channels over which the TRN subfield is transmitted and 1 ≤ *NCB* ≤ 4. | Y | Y |
| TRN\_RX\_PATTERN | FORMAT is EDMG | Indicates the receive antenna pattern to be used when measuring TRN-Units present in a received PPDU.Enumerated type:Quasi-omni: Indicates that quasi-omni AWV should be usedDirectional: Indicates that directed AWV should be used.The parameter is valid only when the PACKET-TYPE is TRN-T-PACKET and EDMG\_TRN\_LEN is greater than 0. | Y | Y |
| EDMG\_BEAM\_TRACKING\_REQUEST | FORMAT is EDMG | This parameter indicates whether beam tracking is requested.Enumerated type:Beam Tracking Requested or Beam Tracking Not Requested | Y | Y |
| CONTROL\_TRAILER | FORMAT is NON\_EDMG | Indicates whether the control trailer is present in the PPDU:Enumerated type:PresentNot Present | Y | Y |
| Otherwise | Not present | N | N |
| CT\_TYPE |  | Indicates the content of the control trailer:Enumerated type:CTS\_DTSGRANT\_RTS\_CTS2selfSPR | Y | Y |
| CH\_BANDWIDTH | FORMAT is EDMG | In the TXVECTOR, indicates the channel width of the transmitted PPDU. In the RXVECTOR, indicates the channel width of the received PPDU.Enumerated type:CBW216 for 2.16 GHzCBW432 for 4.32 GHzCBW648 for 6.48 GHzCBW864 for 8.64 GHzCBW216+216 for 2.16+2.16 GHzCBW432+432 for 4.32+4.32 GHz | Y | Y |
| FORMAT is NON\_EDMG | In TXVECTOR, indicates the channel width of the transmitted PPDU.In RXVECTOR, indicates the estimated channel width of the received PPDU.Enumerated type:CBW432, CBW638, CBW864, CBW216+216, or CBW432+432  | Y | Y |
| CH\_BANDWIDTH\_IN\_NON\_EDMG | FORMAT is NON\_EDMG | In the TXVECTOR, if present, indicates the channel width of the PPDU transmitted with DMG control modulation class in duplicated mode, which is signaled via the scrambling sequence or in the control trailer. In the RXVECTOR, if valid, indicates the channel width of the received PPDU, which is signaled via the scrambling sequence or in the control trailer. Enumerated type: CBW216, CBW432, CBW638, CBW864, CBW216+216, or CBW432+432 if NON\_EDMG\_MODULATION equals NON\_EDMG\_DUP\_C\_MODE | O | Y |
| Otherwise | Not present | N | N |
| EDMG-ADD-PPDU | FORMAT is EDMG | Enumerated Type:ADD-PPDU indicates that this EDMG PPDU is immediately followed by another EDMG PPDU with no IFS or preamble on the subsequent EDMG PPDU.NO-ADD-PPDU indicates no additional EDMG PPDU follows this EDMG PPDU. | Y | Y |
| EDMG\_MODULATION | FORMAT is EDMG | Indicates EDMG modulation type.Enumerated Type:EDMG\_C\_MODE indicates Clause 30.4 EDMG Control modeEDMG\_SC\_MODE indicates Clause 30.5 EDMG SC modeEDMG\_OFDM\_MODE indicates Clause 30.6 EDMG OFDM mode | Y | Y |
| Otherwise | Not present | N | N |
| LDPC\_CW\_TYPE | FORMAT is EDMG | Indicates the LDPC codeword type in terms of code word length.Enumerated Type:SHORT: LDPC codeword length 672, 624, 504, or 468LONG: LDPC codeword length 1344, 1248, 1008, or 936 | Y | Y |
| Otherwise | Not present | N | N |
| LDPC\_SUPERIMPOSED | FORMAT is EDMG | Indicates whether punctured or superimposed LDPC code is used for code rate 7/8 encoding.0 indicates that punctured LDPC code is applied as described in 20.6.3.2.3 and 30.5.8.4.31 indicates that superimposed LDPC code is applied as described in 30.5.8.4.3 | Y | Y |
| Otherwise | Not present | N | N |
| STBC | FORMAT is EDMG | Indicates whether STBC is used.0 indicates no STBC (*NSTS* = *NSS* in the Data field).1 indicates STBC is used (*NSTS* = 2, *NSS* = 1, in the Data field). | Y | Y |
| Otherwise | Not present | N | N |
| DCM\_SQPSK | FORMAT is EDMG | Indicates that DCM SQPSK (30.5.8.5.2) modulation is applied. Enumerated typeDCM\_SQPSK\_NotApplied indicates that DCM SQPSK is not appliedDCM\_SQPSK\_Applied indicates that DCM SQPSK is applied | Y | Y |
| Otherwise | Not present | N | N |
| NUC\_MOD | FORMAT is EDMG | Indicates that NUC modulation (30.5.8.5.X) is applied. Enumerated type:NUCNotApplied indicates that NUC modulation is not appliedNUCApplied indicates that NUC modulation is appliedNUC\_MOD can be set to NUCApplied if EDMG\_MODULATION equals EDMG\_SC\_MODE. Otherwise it is set to NUCNotApplied. | MU | Y |
| Otherwise | Not present | N | N |
| PHASE\_HOPPING | FORMAT is EDMG | Indicates that phase hopping modulation (30.6.7.2) is applied.Enumerated type:PhaseHoppingNotApplied indicates that phase hopping modulation is not appliedPhaseHoppingApplied indicates that phase hopping modulation is applied | Y | Y |
| Otherwise | Not present | N | N |
| OPEN\_LOOP\_PRECODING | FORMAT is EDMG | Indicates that open loop precoding (30.6.7.2) is applied.Enumerated type:OpenLoopPrecodingNotApplied indicates that open loop precoding is not appliedOpenLoopPrecodingApplied indicates that open loop precoding is applied | Y | Y |
| Otherwise | Not present | N | N |
| EDMG\_MCS | FORMAT is EDMG | In the TXVECTOR, indicates that the modulation and coding scheme applied for the transmission of the packet. In the RXVECTOR, indicates the modulation and coding scheme of the received packet. Values are integers in the range 0 to 20. If EDMG\_MODULATION is EDMG\_C\_MODE valid EDMG\_MCS value is 0.If EDMG\_MODULATION is EDMG\_SC\_MODE valid EDMG\_MCS values are 1 to 20.If EDMG\_MODULATION is EDMG\_OFDM\_MODE valid EDMG\_MCS values are 1 to 19. | SU+MU | Y |
| Otherwise | Not present | N | N |
| EDMG\_LENGTH | FORMAT is EDMG | Indicates the length of the PSDU in octets in the range of 1 to 222-1. This value is used by the PHY to determine the number of octet transfers that occur between the MAC and the PHY. | MU | Y |
| Otherwise | Not present | N | N |
| NUM\_STS | FORMAT is EDMG | Indicates the number of space-time streams.Values is an integer~~:~~ in the range 1 ~~–~~to 8 for SU PPDU.~~, 1 – 2 per user for MU~~.For MU PPDU, values are integers in the range 1 to 2 per user in TXVECTOR, 0 to 2 per user in RXVECTOR. NUM\_STS summed over all users is in the range of 1 to 8. | MU | Y |
| Otherwise | Not present | N | N |
| NUM\_USERS | FORMAT is EDMG | Indicates the number of users with nonzero space-time streams.Integer: range 1 to 8 in case of 1 space-time stream per user, range 1 to 4 in case of 2 space-time streams per user. | Y | N |
| Otherwise | Not present | N | N |
| MU\_AID | FORMAT is EDMG and NUM\_USERS>1 | Indicates the intended recepients addressed in MU PPDU via AID | MU | O |
| Otherwise | Not present | N | N |
| EDMG\_TONE\_PAIRING | FORMAT is EDMG | Used to differentiate between indicate Static and Dynamic Tone Pairing. Enumerated Type: STATIC to indicate Static Tone Pairing (30.6.6.3.8.2)DYNAMIC to indicate Dynamic Tone Pairing (30.6.6.3.8.3) | Y | Y |
| Otherwise | Not present | N | N |
| PSK\_APPLIED | FORMAT is EDMG | Indicates if π/2-8-PSK is applied for MCS 12 and MCS 13.Enumerated Type:PskApplied indicates that π/2-8-PSK is applied.PskNotApplied indicated that π/2-8-PSK is not applied | Y | Y |
| Otherwise | Not present | N | N |
| NOTE – In the “TXVECTOR” and “RXVECTOR” columns, the following applies:Y = PresentN = Not presentO = OptionalSU indicates that the parameter is present for each spatial stream. Those parameters are conceptually supplied as an array of values indexed by values 0 to NUM\_STS-1 if STBC is not applied or indexed by 0 if STBC is applied.MU indicates that the parameter is present once for an EDMG SU PPDU and present per user for an EDMG MU PPDU. Parameters specified to be present per user are conceptually supplied as an array of values indexed by ~~iuser, where iuser takes~~ values 0~~1~~ to NUM\_USERS-1.SU+MU indicates that the parameter is present for each spatial stream and each user. Those parameters are conceptually supplied as a two dimensional array of values indexed by values 0 to NUM\_STS-1 if STBC is not applied or by 0 if STBC is applied and 0 to NUM\_USERS-1. |

1. —EDMG-Header-A field structure and definition for a SU PPDU

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| --- | --- | --- | --- |
| **Field** | **Number of bits** | **Start bit** | **Description** |
| SU/MU Format | 1 | 0 | A bit constructed from the NUM\_USERS parameter in the TXVECTOR. Indicates whether the PPDU is a SU PPDU or a MU PPDU. Set to 0 to indicate a SU PPDU and set to 1 otherwise. |
| Channel Aggregation | 1 | 1 | A bit constructed from the CH\_BANDWIDTH parameter in the TXVECTOR.Set to 0 to indicate that the BW field specifies a 2.16 GHz, 4.32 GHz, 6.48 GHz or 8.64 GHz channel PPDU. Set to 1 to indicate that the BW field specifies a 2.16+2.16 GHz or 4.32+4.32 GHz PPDU. |
| BW | 8 | 2 | A bitmap constructed from the CH\_BANDWIDTH parameter in the TXVECTOR and that indicates the 2.16 GHz channel(s) over which the PPDU is transmitted on. If a bit is set to 1, it indicates that the corresponding channel is used for the PPDU transmission; otherwise if the bit is set to 0, the channel is not used. Bit 0 corresponds to channel 1, bit 1 corresponds to channel 2, and so on. |
| Primary Channel Number | 3 | 10 | Corresponds to the TXVECTOR parameter PRIMARY\_CHANEL and contains the 3 LSBs of the primary channel number of the BSS minus one |
| Beamformed | 1 | 13 | Corresponds to the TXVECTOR parameter BEAMFORMED. It is ~~S~~set to 1 to indicate that channel estimate smoothing is recommended. Set to 0 otherwise. |
| Short/Long LDPC | 1 | 14 | Corresponds to the TXVECTOR parameter LDPC\_CW\_LENGTH. Indicates the LDPC codeword length used in the PSDU. Set to 0 for LDPC codeword of length 672, 624, 504, or 468. Set to 1 for LDPC codeword of length 1344, 1248, 1008, or 936. |
| STBC Applied | 1 | 15 | Corresponds to the TXVECTOR parameter STBC.If set to 1, indicates that STBC was applied at the transmitter. Otherwise, set to 0. |
| PSDU Length | 22 | 16 | Length of the PSDU field in octets. |
| Number of SS | 3 | 38 | Inferred from the TXVECTOR parameter NUM\_STS and STBC. The value of this field plus one indicates the number of SSs transmitted in the PPDU.  |
| EDMG-MCS | 21 | 41 | If the number of SSs, as indicated by the Number of SS field, is 4 or less, the EDMG-MCS field is as defined in Table 18. Otherwise, the EDMG-MCS field is as defined in Table 19. The EDMG-MCS field is inferred from TXVECTOR parameter EDMG\_MCS. |
| DCM SQPSK Applied | 1 | 62 | Corresponds to the TXVECTOR parameter DCM\_SQPSK.If set to 1 and the PSDU is encoded using the EDMG SC mode, it indicates that DCM SQPSK modulation defined in 30.5.9.5.2 was applied at the transmitter. If set to 1 and the PSDU is encoded using the EDMG OFDM mode with two spatial streams, it indicates that MIMO SQPSK modulation defined in 30.6.6.3.4 was applied at the transmitter. In all other cases, this field is set to 0.  |
| NUC Applied | 1 | 63 | Corresponds to the TXVECTOR parameter NUC\_MOD.If this field is set to 1, NUC is applied at the transmitter for all MCSs indicated within the EDMG-MCS field and that support NUC. If a MCS indicated within the EDMG-MCS field does not support NUC, uniform constellation is applied for this particular MCS. If set to 0, uniform constellation is applied for all MCSs signalled in EDMG-MCS field.  |
| EDMG TRN Length | 8 | 64 | Corresponds to the TXVECTOR parameter EDMG\_TRN\_LEN and i~~I~~ndicates the number of TRN-Units present in the TRN field of the PPDU. |
| RX TRN-Units per Each TX TRN-Unit | 8 | 72 | Corresponds to TXVECTOR parameter RX\_TRN\_PER\_TX\_TRN.This field is reserved if the value of the EDMG TRN Length field is 0. Otherwise, the value of this field plus one indicates the number of consecutive TRN-Units in the TRN field for which the transmitter remains with the same transmit AWV.  |
| EDMG TRN-Unit P | 2 | 80 | For EDMG BRP-TX and EDMG BRP-RX/TX packets, the value of this field describes the number of TRN subfields in a TRN-Unit which are transmitted with the same AWV as the preamble and data field, as defined in 30.9.2.2.5. The value of this field corresponds to TXVECTOR parameter EDMG\_TRN\_P. Possible values for this field are:* 0: indicates zero TRN subfields
* 1: indicates one TRN subfield
* 2: indicates two TRN subfields
* 3: indicates four TRN subfields

For EDMG BRP-RX packets, this field is reserved. |
| EDMG TRN-Unit M | 4 | 82 | For EDMG BRP-TX packets, the value of this field plus one indicates the number of TRN subfields in a TRN-Unit in which the transmitter may change AWV at the beginning of each TRN subfield transmission, as defined in 30.9.2.2.5. For EDMG BRP-RX/TX packets, the value of this field plus one indicates the number of TRN subfields in a TRN-Unit transmitted with the same AWV following a possible AWV change, as defined in 30.9.2.2.5. This field corresponds to TXVECTOR parameter EDMG\_TRN\_M. For EDMG BRP-RX packets, this field is reserved. |
| EDMG TRN-Unit N | 2 | 86 | For EDMG BRP-TX packets, the value of this field indicates the number of consecutive TRN subfields within EDMG TRN-Unit M which are transmitted using the same AWV, as defined in 30.9.2.2.5. This field corresponds to TXVECTOR parameter EDMG\_TRN\_N. Possible values for this field are:* 0: indicates one TRN subfield
* 1: indicates two TRN subfields
* 2: indicates three TRN subfields if EDMG TRN-Unit M is equal to 3, 6, 9 or 12; indicates eight TRN subfields if EDMG TRN-Unit M is equal to 8 or 16.
* 3: indicates four TRN subfields

For EDMG BRP-RX and EDMG BRP-RX/TX packets, this field is reserved. |
| TRN Subfield Sequence Length | 2 | 88 | This field is reserved if the value of the EDMG TRN Length field is 0. Otherwise, this field indicates the length of the Golay sequence used to transmit the TRN subfields present in the TRN field of the PPDU, it corresponds to TRN\_SEQ\_LENGTH, and is set as follows: * Set to 0 to indicate normal sequence length of 128× *NCB*
* Set to 1 to indicate long sequence length of 256× *NCB*
* Set to 2 to indicate short sequence length of 64× *NCB*
* Value 3 is reserved

*NCB* represents the integer number of contiguous 2.16 GHz channels over which the TRN subfield is transmitted and 1 ≤ *NCB* ≤ 4. |
| TRN-Unit RX Pattern | 1 | 90 | Corresponds to TXVECTOR parameter TRN\_RX\_PATTERN.If set to 1 in a BRP-TX packet, indicates that the measurements of the TRN-Units is to be done using a quasi-omni antenna pattern. Otherwise if set to 0 in a BRP-TX packet, indicates that the measurements of the TRN-Units is to be done using a directional AWV receive antenna configuration. For all other cases, this field is reserved. |
| EDMG Beam Tracking Request | 1 | 91 | Corresponds to the TXVECTOR parameter EDMG\_BEAM\_TRACKING\_REQUEST.Set to 1 to indicate the need for beam tracking (10.38.7); otherwise, set to 0.The EDMG Beam Tracking Request field is reserved when the EDMG TRN Length field is 0. |
| EDMG Beam Tracking Request Type | 1 | 92 | Corresponds to the TXVECTOR parameter EDMG\_BEAM\_TRACKING\_TYPE.Set to 0 to indicate analog beam tracking (10.38.7); set to 1 to indicate baseband beam tracking (10.38.7).This field is reserved when the EDMG Beam Tracking Request field is reserved. |
| Phase Hopping | 1 | 93 | Corresponds to TXVECTOR parameter PHASE\_HOPPING.If set to 1 in an EDMG OFDM mode PPDU, this field indicates that phase hopping modulation is used. Otherwise this field is set to 0. This field is reserved in an EDMG SC mode PPDU, or if the transmitter or receiver do not support phase hopping. |
| Open Loop Precoding | 1 | 94 | Corresponds to TXVECTOR parameter OPEN\_LOOP\_PRECODING.If the Phase Hopping field is set to 1, this field indicates if open loop precoding is used. If this field is 1, open loop precoding is used. Otherwise, open loop precoding is not used. If the Phase Hopping field is reserved, this field is also reserved. |
| Additional EDMG PPDU | 1 | 95 | Corresponds to TXVECTOR parameter EDMG-ADD-PPDU.A value of 1 indicates that this EDMG PPDU is immediately followed by another EDMG PPDU with no IFS or preamble in between the PPDUs. A value of 0 indicates that no additional EDMG PPDU follows this EDMG PPDU. |
| Superimposed Code Applied | 1 | 96 | Corresponds to TXVECTOR parameter LDPC\_SUPERIMPOSED. If the LDPC code rate is 7/8 and this field is set to zero, it indicates puncturing code with codeword length 624 or 1248 is applied. If the LDPC code rate is 7/8 and this field is set to one, it indicates that superimposed code with codeword length 672 or 1344 is applied. In all other cases, this field is reserved.  |
| π/2-8-PSK Applied | 1 | 97 | Corresponds to TXVECTOR parameter PSK\_APPLIED.If this field is set to 1, π/2-8-PSK with corresponding LDPC shortening code with rates 2/3 or 5/6 is applied at the transmitter for MCS 12 or 13, respectively, as indicated within the EDMG-MCS field. If set to 0, π/2-16-QAM constellation with regular LDPC code with rates ½ or 5/8 is applied at the transmitter for MCS 12 or 13, respectively, as indicated in the EDMG-MCS field.  |
| Number of Transmit Chains  | 3 | 98 | Corresponds to TXVECTOR parameter NUM\_TX\_CHAINS.The value of this field plus 1 indicates the number of transmit chains used in the transmission of the PPDU. The value of the field plus 1 also indicates the total number of orthogonal sequences in a TRN field (see 30.9.2.2.5). This field is reserved when the EDMG TRN Length field is 0 or the EDMG Beam Tracking Request is 0.  |
| DMG TRN  | 1 | 101 | Corresponds to TXVECTOR parameter DMG\_TRN.When set to 1, indicates that the TRN field appended to this PPDU has the structure of a DMG TRN field as defined in 20.10.2.2.2. In this case, the RX TRN-Units per Each TX TRN-Unit, the EDMG TRN-Unit P, the EDMG TRN-Unit M, the EDMG TRN-Unit N, and the TRN Subfield Sequence Length fields are reserved. This field is reserved when the EDMG TRN Length field is equal to 0. |
| Tone Pairing Type | 1 | 102 | Corresponds to TXVECTOR parameter EDMG\_TONE\_PAIRING. This field is valid for EDMG OFDM mode transmissions, otherwise it is reserved. Set to 0 to indicate Static Tone Pairing (30.6.6.3.8.2). Set to 1 to indicate Dynamic Tone Pairing (30.6.6.3.8.3).  |
| First Path Training | 1 | 103 | Corresponds to the TXVECTOR parameter FIRST\_PATH\_TRAINING. When set to 1, indicates that the TRN field appended to this PPDU is used for first path beamforming training. Set to 0 otherwise. This field is reserved when the EDMG TRN Length field is equal to 0. |
| Reserved | 17 | 95 | Set to 0 by the transmitter and ignored by the receiver. |
| CRC | 16 | 112 | Header Check sequence. Calculation of the header check sequence is defined in 20.3.7. |

The AID subfield indicates the AID of a STA addressed by an MPDU contained within the MU PPDU and corresponds to TXVECTOR parameter MU\_AID. The AID of a STA shall not appear more than once across all SS Descriptor Set fields included in the EDMG-Header-A. The SS Descriptor Set field is reserved if the value of the AID subfield is zero.

The value of the Number of SS subfield plus one indicates the number of SSs transmitted to the STA indicated by the AID subfiel. The field value is inferred from the TXVECTOR parameters NUM\_STS and STBC. SSs are assigned sequentially across all STAs addressed by the MU PPDU.

**Table 40 —EDMG-Header-B field structure and definition**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Number of bits** | **Start bit** | **Description** |
| Scrambler Seed  | 7 | 0 |  |
| PSDU Length | 22 | 7 | Length of the PSDU field in octets. |
| EDMG-MCS1 | 5 | 29 | Indicates the modulation and coding scheme for the first spatial stream. If the IsSCPSDU field in the L-Header is equal to 1, this field contains a SC MCS index. If the IsSCPSDU field in the L-Header is equal to 0, this field contains an OFDM MCS index. The EDMG-MCS field is inferred from TXVECTOR parameter EDMG\_MCS. |
| EDMG-MCS2 | 5 | 34 | Indicates the modulation and coding scheme for the second spatial stream and is reserved if the number of spatial streams is 1. If the IsSCPSDU field in the L-Header is equal to 1, this field contains a SC MCS index. If the IsSCPSDU field in the L-Header is equal to 0, this field contains an OFDM MCS index. The EDMG-MCS field is inferred from TXVECTOR parameter EDMG\_MCS. |
| Superimposed Code Applied | 1 | 39 | Corresponds to TXVECTOR parameter LDPC\_SUPERIMPOSED.If the LDPC code rate is 7/8 and this field is set to zero, it indicates puncturing code with codeword length 624 or 1248 is applied.If the LDPC code rate is 7/8 and this field is set to one, it indicates that superimposed code with codeword length 672 or 1344 is applied.In all other cases, this field is reserved.  |
| NUC Applied | 1 | 40 | Corresponds to the TXVECTOR parameter NUC\_MOD. If this field is set to 1, NUC is applied at the transmitter for the MCSs indicated by the EDMG-MCS1 field or the EDMG-MCS2 field, if supported. If an indicated MCS does not support NUC, uniform constellation is applied for this particular MCS.If set to 0, uniform constellation is applied for MCSs signalled in the EDMG-MCS1 field and the EDMG-MCS2 field. |
| Spoofing Error Length Indicator | 1 | 41 | If set to 0 in an EDMG OFDM PPDU, indicates that the spoofing error, defined as the difference between the PPDU duration calculated based on L-Header and the actual PPDU duration, is smaller than TOFDM-SYM, where TOFDM-SYM = TDFT + TGI, TDFT is the OFDM IDFT/DFT period and TGI is the guard interval duration, which is determined by bits B2 and B3 of the Last RSSI field within the L-Header of the PPDU. Otherwise, if set to 1 in an EDMG OFDM PPDU, indicates that the spoofing error is greater than or equal to TOFDM-SYM. For an EDMG SC PPDU, this field is reserved. |
| Reserved | 6 | 42 |  |
| CRC  | 16 | 48 | Header Check sequence. Calculation of the header check sequence is defined in 20.3.7. |

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed Change |
| 519 | 30.3.3.3.2.3 | EDMG-header-A field structure for a FDMA MU PPDU is incomplete. | It's not clear why e.g TRN parameters are not signaled. Please complement |

Proposed resolution: Obsolete.

Work on MU-FDMA is not continued further. See CID 337.

**SP:**

Do you agree to adopt the comment resolutions to CIDs 97, 290, 405, 416, 417, 418, 419, 420, and 519 as proposed in document 11-17/1664r0?