IEEE P802.11  
Wireless LANs

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| --- | --- | --- | --- | --- |
| Resolution of some preamble comments | | | | |
| Date: 2017-07-10 | | | | |
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Abstract

This document proposes resolutions to CID 10, 25, 61, 62, 64, 131, 133, 320, 481, 484, 518, and 520.

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| CID | Clause | Comment | Proposed Change |
| 10 | 30.3.3.2.2 | Text does not describe how to handle transition between upsampled pre-EDMG modulated fields and EDMG waveform | Add text to described how to handle transition. One example is overlap-and-add during transition region. |

Proposed resolution: Accept.

Discussion: Either truncate or add to EDMG portion in an overlap add sense. Actual method can be left open to implementer. Beginning of oversampled pre-EDMG part is truncated.

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| CID | Clause | Comment | Proposed Change |
| 61 | 30.3.3.2.2 | "is out of scope of this standard" indicate that this is also implementation specific | "is implementation specific and out of scope of this standard" |

Proposed resolution: Accept.

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| CID | Clause | Comment | Proposed Change |
| 62 | 30.3.3.2.2 | "SC chip time duration" - indicate that this is for the 2.16GHz channel and piont to where it is defined | "SC chip time duration at 2.16GHz widith channel (see Table ?" |

Proposed resolution: Accept.

Discussion: Tc is the SC chip time duration as defined in Table 20-4

* + - 1. Definition

A non-EDMG PPDU sent over a 4.32 GHz, 6.48 GHz or 8.64 GHz channel shall be transmitted in a non-EDMG duplicate mode. For SC PPDU transmission of more than one transmit chain, the non-EDMG duplicate waveform includes a cyclic shift dependent on the particular transmit chain number.

The non-EDMG PPDU waveform shall be defined at the SC chip rate *FC* equal to 1.76 GHz and include the following modulated fields:



where:

*tCE* = *TSTF*

*tHeader* = *tCE + TCE*

*tData* = *tHeader + THeader*

*tTRN* = *tData + TData*

The TRN field may be present in a 2.16 GHz PPDU transmission and shall not be present for 4.32 GHz, 6.48 GHz, or 8.64 GHz PPDU transmission.

The non-EDMG PPDU waveform for the *iTXth* transmit chain includes a cyclic shift *TiTXSC* dependent on the particular transmit chain number. The time shift *TiTXSC* is defined in SC chip units as (*i*-1)×*NC*×*TC*, where *NC* is equal to 4 and *TC* is a SC chip time duration.

The non-EDMG PPDU waveform for the *iTXth* chain transmission over a 2.16 GHz channel shall be defined as follows:



where:

*N* = length(*rnon-EDMG*)

The non-EDMG duplicate waveform is obtained by up-sampling and filtering and then appropriate carrier frequency shift of the *riTXnon-EDMG* waveform. The up-sampling procedure includes an up-sampling by a factor of *NCB* (*NCB* = 2, 3, or 4) and then filtering by the pulse shaping filter *hSCCB* defined at the *NCB*×1.76 GHz sampling rate. The definition of *hSCCB* is implementation specific and out of scope of this standard.

The up-sampled waveform for a 2.16 GHz channel transmission shall be defined as follows:



where:

*K* is the length of *hSCCB*

*TC* is ~~a~~the SC chip time duration as defined in Table 20-4.



As the length of  may exceed  either truncation or an addition of the exceeding samples to EDMG signal portion in the sense of overlap-add method may be applicable. The applied method is implementation specific and out of scope of this standard.

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| CID | Clause | Comment | Proposed Change |
| 25 | 30.3.3.3.5.1 | CRC for EDMG-Header-B should be added | Define CRC exactly in the same way as for EDMG-Header-A |

Proposed resolution: Accept.

**Table 24 —EDMG-Header-B field structure and definition**

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| --- | --- | --- | --- |
| **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. |
| 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. |
| NUC Applied | 1 | 39 | If the MCS indicated by either the EDMG-MCS1 field or the EDMG-MCS2 field does not support non-uniform constellation, uniform constellation was applied to both streams and this field is reserved.  Otherwise and if this field is set to 1, non-uniform constellation was applied at the transmitter for the MCSs indicated by the EDMG-MCS1 and EDMG-MCS2 fields. If set to 0, uniform constellation was applied. |
| Reserved | 8~~24~~ | 40 |  |
| CRC | 16 | 48 | Header Check sequence. Calculation of the header check sequence is defined in 20.3.7. |

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| CID | Clause | Comment | Proposed Change |
| 64 | 30.3.3.2.6 | "∩é╛ For an EDMG SC mode PPDU or an EDMG OFDM mode PPDU" we need to add that A-PPDU=0 and BeamTracking=0" | As in comment |

Proposed resolution: Accept.

**30.3.3.2.5.1 General**

The structure of the L-Header field is defined as follows:

* For a control mode PPDU, the L-Header field is the same as the DMG control mode header field (see Table 20-11) and the reserved bits 22 and 23 shall be both set to 1. In this case:
* The Scrambler Initialization field in the L-Header is defined as shown in Table 10; and
* If the control mode PPDU is an EDMG control mode PPDU, the Length field shall be set so that the spoofing error is non-negative and less than or equal to 150 ns, except for PPDU durations between 347.56 µs and 347.93 µs and between 349.10 µs and 350.76 µs where the maximum spoofing error shall be 0.37 µs and 1.66 µs, respectively. Spoofing error is defined as the difference between the PPDU duration calculated based on L-Header and the actual PPDU duration.
* For an EDMG SC mode PPDU or an EDMG OFDM mode PPDU, the L-Header field is the same as the DMG SC mode PHY header (see Table 20-17) with the following changes:
* The reserved bit 46 shall be set to 1 to indicate the presence of the EDMG-Header-A field. This implies that the PPDU is an EDMG PPDU; and
* The Last RSSI field shall be redefined as shown in Table 12; and
* The 5 LSBs of the Length field shall be redefined as shown in Table 13. Moreover, the remaining bits of the Length field shall be set so that the spoofing error is smaller than one symbol block (512×Tc) and non-negative, where spoofing error is defined as the difference between the PPDU duration calculated based on L-Header and the actual PPDU duration; and
* The Additional PPDU field and the beam tracking request field are both set to zero.

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| CID | Clause | Comment | Proposed Change |
| 131 | 30.3.3.2.6 | spoofing error should be the define as the absolute value of the difference between the PPDU duration calculated based on L-Header and the actual PPDU duration. | AS in comment. |

Proposed resolution: Reject.

The draft defines the spoofing error such that it is non-negative, i.e. it is overestimated. Consideration of absolute value would imply to allow for negative spoofing errors, i.e. spoofing could be too short.

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| CID | Clause | Comment | Proposed Change |
| 133 | 30.3.3.2.6 | The Channel BW field should always be indicated, regardless of whether the PPDU is RTS, DMG CTS, or DMG DTS frame | Remove the clause "When the PPDU contains an RTS, a DMG CTS or a DMG DTS frame" and "Otherwise, the Channel BW field is reserved." |

Proposed resolution: Reject.

It is not specified why channel BW information for other legacy DMG control mode PPDUs other than those PPDUs mentioned is required. This particular channel BW information is used for bandwidth negotiation in RTS/CTS. All EDMG PPDUs hold channel BW indication in header-A. Furthermore, the length field in L-Header holds compressed BW information in case of EDMG transmission.

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| CID | Clause | Comment | Proposed Change |
| 320 | 30.3.3.1 | Given that non-EDMG is identical to DMG, this paragraph is very complex - basically all that needs to be said is EDMG format preamble includes a DMG portion and an EDMG portion. The DMG portion of the preamble allows DMG STAs to receive and process EDMG PPDUs in a backward compattable manner | Simplify the wording and complexity of the clause, so that it simply states that DMG STAs can receive EDMG PPDU perambles for backward complatiblity, and the can also receive duplicate mode PPDUs as if they are DMG PPDUs. Remove the terminology of pre-EDMG as the only pre-EDMG is DMG. |

Proposed resolution: Reject.

Non-EDMG is not identical to DMG (see also CID 304)

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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 delay 14 with respect to the corresponding fields transmitted over the primary channel that is between zero 15 (inclusive) and Tc (inclusive), where Tc=1/1.76 GHz. The relative delay applicable to each secondary 16 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 |
| 481 | 30.3.3.2.6 | As like all 802.11 standards, spoofing algorithm for EDMG PPDU should be defined as either normative or informative description. | The spoofing algorithm for EDMG PPDU should be described in the draft body. |

Proposed resolution: Obsolete.  
Now in section 30.3.3.2.5.2 (11-17-0750)

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| CID | Clause | Comment | Proposed Change |
| 484 | 30.3.3.3.2.2 | The aggregation field in EDMG Header-A in EDMG control mode PPDU should be defined to indicate whether TRN format is bonded or aggregated. | Define the aggregation field in EDMG Header-A in EDMG control mode PPDU to indicate whether TRN format is bonded or aggregated. |

Proposed resolution: Obsolete.  
Comment is fixed in D0.35

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| CID | Clause | Comment | Proposed Change |
| 518 | 30.3.3.3.2.3 | NUC applied signaling restricts NUC usage. Assume NUC support for 64-QAM, then is would not be possible to have two spatial streams with 16-QAM and 64-NUC | Change description to "If this field is set to 1, NUC is applied at the transmitter for all MCSs indicated within the EDMG-MCS field which do 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 was applied for all MCSs signaled in EDMG-MCS field." |

Proposed resolution: Accept.

**Table 17—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 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. |
| STBC Applied | 1 | 15 | 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 | 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. |
| DCM SQPSK Applied | 1 | 62 | If set to 1, indicates that DCM SQPSK (30.5.7.4.2) was applied at the transmitter. Otherwise, set to 0. |
| NUC Applied | 1 | 63 | ~~If any of the MCSs indicated within the EDMG-MCS field does not support non-uniform constellation, uniform constellation is applied for all MCSs and this field is reserved.~~  ~~Otherwise and if this field is set to 1, non-uniform constellation is applied at the transmitter for the MCSs indicated within the EDMG-MCS field. If set to 0, uniform constellation was applied.~~  If this field is set to 1, NUC is applied at the transmitter for all MCSs indicated within the EDMG-MCS field which do 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 signaled in EDMG-MCS field. |
| EDMG TRN Length | 8 | 64 | Indicates the number of TRN-Units present in the TRN field of the PPDU. |
| RX TRN-Units per Each TX TRN-Unit | 8 | 72 | 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. 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. 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. 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 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 | 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. |
| Phase Hopping | 1 | 92 | If set to 1 in an EDMG OFDM mode PPDU, this field indicates that phase hopping 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 | 93 | 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 | 94 | 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. |
| 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. |

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| CID | Clause | Comment | Proposed Change |
| 520 | 30.3.3.3.5.1 | NUC applied signaling restricts NUC usage. Assume NUC support for 64-QAM, then is would not be possible to have two spatial streams with 16-QAM and 64-NUC | Change description to "If this field is set to 1, NUC is applied at the transmitter for the MCSs indicated by EDMG-MCS1 field or 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 was applied for both MCSs signaled in EDMG-MCS1 field and EDMG-MCS2 field." |

Proposed resolution: Accept.

Table 24 - EDMG-Header-B field structure and definition

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| --- | --- | --- | --- |
| **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. |
| 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. |
| NUC Applied | 1 | 39 | ~~If the MCS indicated by either the EDMG-MCS1 field or the EDMG-MCS2 field does not support non-uniform constellation, uniform constellation was applied to both streams and this field is reserved.~~  ~~Otherwise and if this field is set to 1, non-uniform constellation was applied at the transmitter for the MCSs indicated by the EDMG-MCS1 and EDMG-MCS2 fields. If set to 0, uniform constellation was applied.~~  If this field is set to 1, NUC is applied at the transmitter for the MCSs indicated by EDMG-MCS1 field or 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 both MCSs signaled in EDMG-MCS1 field and EDMG-MCS2 field. |
| Reserved | 24 | 40 |  |

**SP:**

Do you agree to adopt the comment resolutions to CIDs 10, 25, 61, 62, 64, 131, 133, 320, 481, 484, 518, and 520 as proposed in document 11-17/1075r1?