IEEE P802.11
Wireless LANs

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| CRs for packet extension in 28.3.12 |
| Date: 2017-04-05 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Sungeun Lee | Cypress Semiconductor Corporation | Hazlet, NJ, 07730 |  | sungeun.lee at cypress.com |
| Yujin Noh | Newracom | Irvine |  | yujin.noh at newracom.com |

Abstract

* The submission provides resolutions to comment related to packet extension.
* This document contains comment resolutions for 17 CIDs:
	+ 7519, 7672, 9022, 7520, 7676, 7673, 4880, 7675, 9023, 7521, 7674, 9488, 9024, 10072, 7522, 9323, 7523
* The proposed changes are based on **P802.11ax D1.2 for Clauses 9.3.1.23, 28.3.10.7.2, and 28.3.12.**
* Rev. 0: initial version of the document
* Rev. 1: separate Packet Extension subfield into two parts, Pre-FEC padding factor and PE Disambiguity subfields and update the text
* Rev. 2: Add the description for an HE SU, HE ER SU, HE MU PPDU to calculate PE Disambiguity field using Eq. (28-113)

NOTE – Set the Track Changes Viewing Option in the MS Word to “All Markup” to clearly see the proposed text edits.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| **CID** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 7519 | 28.3.12 | 337 | 27 | The third paragraph of clause 28.3.12 only involves packet extension for HE SU PPDU or HE extended range SU PPDU. | change"For an HE PPDU,..."to"For an HE SU PPDU or HE extended range SU PPDU,..." | **Rejected**This paragraph describes the generic concept of maximum PE durations for all HE PPDU formats. |
| 7672 | 28.3.12 | 338 | 41 | The sentence "The first two bits in the packet extension subfield indicate the pre-FEC padding factor and the thir bit indicates the PE-disambiguity" does not belong here. Further, if it is retained, the language needs improvement | Delete the sentence. | **Revised**Agree in principle, and it is also required to clarify the bit encoding process in Trigger frame. Therefore, insert the the new figure and table for Packet Extension subfield encoding in Trigger frame part on P802.11ax D1.2clause 9.3.1.23, and refer the Figure and Table directly. *TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 7672 |
| 9022 | 28.3.12 | 338 | 41 | Add reference to Trigger frame after "Common Info field of the Trigger frame" (section 9.3.1.23) | See comment | **Revised**Agree in principle, and it is also required to clarify the bit encoding process in Trigger frame. Therefore, insert the the new figure and table for Packet Extension subfield encoding in Trigger frame part on P802.11ax D1.2clause 9.3.1.23, and refer the Figure and Table directly. *TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 9022 |
| 7520 | 28.3.12 | 338 | 50 | The HE preamble is inclusive of RL-SIG and HE-SIG-A. | 1. T\_RL-SIG and T\_HE-SIG-A should be removed from (28-114) as well as the equation of N\_SYM following (28-114)2. Update T\_HE-PREAMBLE by including T\_RL-SIG and T\_HE-SIG-A | **Revised**HE preamble is composed of pre-HE modulation and HE modulation parts as defined in P802.11ax D1.2 Clause 28.3.10.1. Therefore, T\_HE-PREAMBLE should include both T\_RL-SIG and T\_HE-SIG-A as well as HE modulated parts. The equation and T\_HE-PREAMBLE definition parts are updated correspondingly.*TGax Editor*: delete cross-out red part and add a red part in the equation (28-112) and its description shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 7520 |
| 7676 | 28.3.12 | 338 | 50 | Define "m" in the Equation 28-114 | refer to comment | **Revised**Since Equation (28-112) in D1.2 is applied only for HE TB PPDU, add the value of *m=2* explicitly for clarification.*TGax Editor*: add the description ‘m=2 for an HE TB PPDU’ shown in **doc.: IEEE 802.11-17/0694r2** on the part that includes CID 7676 |
| 7673 | 28.3.12 | 338 | 59 | "b\_{PE-Disambiguity} is B2 of the Packet Extension subfield of the Common Info field in the Trigger frame" is inaccurate | Replace with "b\_{PE-Disambiguity} corresponds to the bit B36 in the Trigger frame" | **Revised**b\_{PE-Disambiguity} is indicated by the Packet Extension subfield value in Trigger frame, and explicit definition of Packet Extension subfield in Clause 9.3.1.23 of P802.11ax D1.2 is proposed. Therefore, describe to refer ‘the indicated value of PE Disambiguity in the Packet Extension subfield of the Common Infor field’*TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the part that includes CID 7673 |
| 4880 | 28.3.12 | 338 | 61 | The variable name T\_HE-PERAMBLE defined in line 61 and used in Equation 28-114 has a different meaning from that in equation 26-117 (P340 line 10). Suggest update the equation 28-114 and use the consistent definition of T\_PREABMBLE as in Equation 26-117. | as in comment | **Revised**Agree in principal, and HE preamble is composed of pre-HE modulation and HE modulation parts as defined in P802.11ax D1.2 Clause 28.3.10.1. Therefore, update T\_HE-PREAMBLE to include both T\_RL-SIG and T\_HE-SIG-A as well as HE modulated parts.*TGax Editor*: delete cross-out red part and add red parts in the equation (28-112) and its description shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 4880 |
| 7675 | 28.3.12 | 339 | 1 | Remove Editor's Note | One method to resolve Editor's comment is as follows. Delete lines 1 - 18. Edit line 20: "The Pre-FEC Padding Factor in HE-SIG-A is encoded as shown in Table 28-39 (Pre-FEC Padding Factor subfield encoding)." Edit line 40: "The PE-Disambiguity subfield in HE-SIG shall be set to 1 if the condition in Equation (28-115) is met, otherwise it shall be set to 0." | **Revised**Delete the Editor note after distributing the info of Table 28-38 and Table 28-39 to HE-SIG-A (Clause 28.3.10.7.2) and Trigger frame (Clause 9.3.1.23) in P802.11ax D1.2. In addition, add the description of PE-disambiguity subfield value set condition for HE PPDU formats.*TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 7675 |
| 9023 | 28.3.12 | 339 | 1 | Agree with Editor's note: move lines 3 to 37 to HE-SIG-A section | See comment | **Revised**Agree in principal and move packet extension field info into multiple clauses.*TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 9023 |
| 7521 | 28.3.12 | 339 | 3 | In 28.3.10.7.2, it has been mentioned that HE-SIG-A includes Pre-FEC Padding Factor subfield and PE Disambiguity subfield. In 9.3.1.23, it has also been mentioned that The Packet Extension subfield of the Common Info field indicates the packet extension duration of the TB PPDU response. The first two bits indicate the pre-FEC padding factor and the third bit indicates the PE-Disambiguity. Therefore, the description in L3 to L17 of P339 including Table 28-38 is unnecessary. | 1. remove Editor's Note in L1 of P339;2. remove the description in L3 to L17 including Table 28-38. | **Revised**Agree in principal and move packet extension field info into multiple clauses.*TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 7521 |
| 7674 | 28.3.12 | 339 | 8 | Delete Table 28-38 and its references since the "Packet Extension field in HE-SIG-A" does not exist. In lieu we have "pre-FEC padding factor" and "PE Disambiguity" fields in HE-SIG-A. | refer to comment | **Revised**Agree in principal to delete the table, so propose to change the text and table such that the corresponding information in the table is updated in HE-SIG-A and Trigger frame encoding.*TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 7674 |
| 9488 | 28.3.12 | 339 | 25 | In Table 28-39 Pre-FEC Padding Factor subfield encoding, bxx did not specify which bit is LSB and which bit is MSB. This may not be clear enough for all spec readers. Please specify it | Replace "b" with "B1B0". | **Revised**The Pre-FEC padding factor value would be defined either in HE-SIG-A field or Trigger frame, therefore Table 28-39 is deleted and the corresponding info is updated in HE-SIG-A part and Trigger frame part.*TGax Editor*: make changes shown in **doc.: IEEE 802.11-17/0694r2** on the parts that include CID 9488 |
| 9024 | 28.3.12 | 339 | 58 | text starting on line 58 of page 339 and ending on line 19 of page 340 belongs in HE receive procedure (28.3.20) | Move text to 28.3.20 | **Rejected**.Text commenter mentioned is too detail to be moved to HE receive procedure. Since the purpose of 28.3.12 is to describe the packet extension operation, it is not restricted to the HE transmit procedure. Looking at the HE transmit procedure (28.3.19), it contains the simple description of packet extension.  |
| 10072 | 28.3.12 | 340 | 3 | Once the receiver calculate the number of data symbol, the receiver doesn't need to calculate T\_PE. It can recognize the actual ending time of the PPDU since the PE field, when present, shall be transmitted with the same average power as the Data field. remove Equation (28-117) and corresponding texts in spec. | As in the comment. | **Rejected**.T\_PE in receiving STA is used to calculate RXTIME(us) in Equation (28-128). Therefore, Equation (28-117) is still informative for STA to use. |
| 7522 | 28.3.12 | 340 | 13 | For an HE extended range SU PPDU, the HE-SIG-A duration is represented by T\_HE-SIG-A-R only | remove T\_HE-SIG-A from T\_HE-PREAMBLE for an HE extended range SU PPDU | **Revised**As commenter pointed out, HE-SIG-A duration should be represented by T\_HE-SIG-A-R, so T\_HE-SIG-A for HE ER SU PPDU should be deleted. *TGax Editor*: delete cross-out red part (T\_HE-SIG-A) for an HE extended range SU PPDU at equation (28-115) description shown in **doc.: IEEE 802.11-17/0694r2** on the part that includes CID 7522 |
| 9323 | 28.3.12 | 340 | 13 | T\_{HE-SIG-A-R} is described as HE-SIG-A field duration in an HE extended range SU PPDU and its value is 16 ++s = 4 +∙ 4 ++s in Table 28-9. Also t\_{HE-STF} for an HE extended range SU PPDU is defined as t\_{HE-SIG-A}+T\_{HE-SIG-A-R} on p.263. In these two places, T\_{HE-SIG-A-R} includes both the original HE-SIG-A field duration and the repeated HE-SIG-A field duration. But for T\_{HE-PREAMBLE} for an HE extended range SU PPDU in eq. (28-117), T\_{HE-SIG-A-R} is interpreted to be only for the repeated part and added with T\_{HE-SIG-A}. To be consistent with the usage in Table 28-9 and in p.263, T\_{HE-SIG-A-R} should be the full HE-SIG-A field duration including the repeated part and "+T\_{HE-SIG-A}" should be removed from the expression. | Change the expression for an HE extended range SU PPDU in line 13 to T\_{HE-PREAMBLE} = T\_{RL-SIG}+T\_{HE-SIG-A-R}+T\_{HE-STF-NT}+N\_{HE-LTF}T\_{HE-LTF, SYM}. | **Revised**As commenter pointed out, HE-SIG-A duration should be represented by T\_HE-SIG-A-R, so T\_HE-SIG-A for HE ER SU PPDU should be deleted. *TGax Editor*: delete cross-out red part (T\_HE-SIG-A) for an HE extended range SU PPDU at equation (28-115) description shown in **doc.: IEEE 802.11-17/0694r2** on the part that includes CID 9323 |
| 7523 | 28.3.12 | 340 | 19 | HE-SIG-A field does not include the Packet Extension subfield | change"b\_PE-Disambiguity is PE Disambiguity subfield in the Packet Extension subfield of the HE-SIG-A field"to"b\_PE-Disambiguity is PE Disambiguity subfield of the HE-SIG-A field | **Revised**Agree in principal b\_PE-Disambiguity value is indicated in HE-SIG-A for HE SU, HE ER SU, or HE MU PPDUs. For HE TB PPDU, the value is indicated by Trigger frame, therefore, the corresponding Table is refered to acquire the value.*TGax Editor*: make changes as in **doc.: IEEE 802.11-17/0694r2** on the part that includes CID 7523 |

**Discussion**

The modification clarifies packet extension formula and procedure.

**Changes to Section 28.3.12**

***To TGax editor:*** ***P367L04 in Clause 28.3.12 of P802.11ax D1.2*** *replace the current text with the proposed changes below.*

***------------- Begin Text Changes ---------------***

For an HE TB PPDU, the AP indicates the packet extension duration information for all users in the Packet Extension subfield in the Common Info field of the Trigger frame. The first two bits in the Packet Extension subfield indicate the pre-FEC padding factor and the third bit indicates the PE-Disambiguity. Each user, when responding to the Trigger frame with an HE TB PPDU, shall append PE field at the end of the current HE TB PPDU, with a duration *TPE*. The value of *TPE* can be calculated using Equation (28-112).

(#7520)(#4880) (28-112)

where

*m=2* for an HE TB PPDU(#7676)

(#7520)(#4880)

LENGTH is the value indicated by Length subfield of the Common Info field in the Trigger frame

*b*PE-Disambiguity is an indicated value of PE Disambiguity subfield in the Packet Extension subfield of the Common Info field in the Trigger frame (see Table 9-xyz(Subfields of Packet Extension subfield))(#7673)

(#7520)(#4880)

*T*HE-STF-T, *T*HE-LTF,*SYM*, *T*RL-SIG and *T*HE-SIG-A are defined in Table 28-9 (Timing-related constants)

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(#7675)(#7675)(#9023)(#7521)(#7674)

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(#7675)(#9023)(#7521)(#9488)

The PE Disambiguity field of the HE-SIG-A field for an HE SU, HE ER SU (see Table 28-15 (HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU)) or HE MU PPDU (see Table 28-16 (HE-SIG-A field of an HE MU PPDU)) shall be set to 1 if the condition in Equation (28- 113) is met, otherwise it shall be set to 0.(#7675)

The PE Disambiguity subfield of the Packet Extension subfield for an HE TB PPDU (see Table 9-xyz(Subfields of Packet Extension subfield)) shall be set to 1 if the condition in Equation (28- 113) is met, otherwise it shall be set to 0.(#7675)

 (28-113)

where

*TPE* is the PE field duration

*TSYM* is the symbol duration of the Data field as defined in28.3.8 (Timing-related parameters)

TXTIME (in µs) is defined in28.4.2 (TXTIME and PSDU\_LENGTH calculation)

*SignalExtension* is 0 s when TXVECTOR parameter NO\_SIG\_EXTN is true and is aSignalExtension as defined in Table 19-25 (HT PHY characteristics) when TXVECTOR parameter NO\_SIG\_EXTN is false

The receiver computes *NSYM* and *TPE* using Equation (28-114) and Equation (28-115), respectively.

 (28-114)

 (28-115)

where



(#7522)(#9323)

*T*RL-SIG, *T*HE-STF-T, *T*HE-STF-NT, *T*HE-LTF,SYM, *T*HE-SIG-A, *T*HE-SIG-A-R, *T*HE-SIG-B are defined in Table 28-9 (Timing-related constants)

*N*HE-SIG-B, *N*HE-LTF are defined in Table 28-12 (Frequently used parameters)

*b*PE-Disambiguity is PE Disambiguity subfield of the HE-SIG-A field for an HE SU, HE ER SU or HE MU PPDU, and an indicated value of PE Disambiguity subfield in the Packet Extension subfield of the Common Info field in the Trigger frame (see Table 9-xyz(Subfields of Packet Extension subfield)) for an HE TB PPDU.(#7523)

***------------- End Text Changes ---------------***

**Discussion**

Pre-FEC Padding Factor is indicated in HE-SIG-A for HE SU, HE ER SU, or HE MU PPDU.

**Changes to Section 28.3.10.7.2**

***To TGax editor:*** ***P303L53 of P802.11ax D1.2*** *update the B11-B12 row of Table 28-15 with the proposed changes below.*

***------------- Begin Text Changes ---------------***

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| Table 28-15—HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU  |
| Two Parts of HE-SIG-A | Bit | Field | Number of bits | Description |
| HE-SIG-A2 (HE SU PPDU) or HE-SIG-A3 (HE ER SU PPDU) | B11-B12 | Pre-FEC Padding Factor | 2 | Indicates the pre-FEC padding factor value.Set to 0 to indicate Pre-FEC padding factor value of 4Set to 1 to indicate Pre-FEC padding factor value of 1Set to 2 to indicate Pre-FEC padding factor value of 2Set to 3 to indicate Pre-FEC padding factor value of 3(#9023)(#7521) |

***------------- End Text Changes ---------------***

**Changes to Section 28.3.10.7.2**

***To TGax editor:*** ***P306L44 of P802.11ax D1.2*** *update the B13-B14 row of Table 28-16 with the proposed changes below.*

***------------- Begin Text Changes ---------------***

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| Table 28-16—HE-SIG-A field of an HE MU PPDU  |
| Two Parts of HE-SIG-A | Bit | Field | Number of bits | Description |
| HE-SIG-A2 | B13-B14 | Pre-FEC Padding Factor | 2 | Indicates the pre-FEC padding factor value.Set to 0 to indicate Pre-FEC padding factor value of 4Set to 1 to indicate Pre-FEC padding factor value of 1Set to 2 to indicate Pre-FEC padding factor value of 2Set to 3 to indicate Pre-FEC padding factor value of 3(#9023)(#7521) |

***------------- End Text Changes ---------------***

**Discussion**

Packet Extension subfield of the Common Info field in Trigger frame contains two types of information in three bits: Pre-FEC padding factor info and PE Disambiguity info. Since there is no sub-subfield of Packet Extension subfield to distinguish, it is clear to explicitly describe all cases of Packet Extension subfield in clause 9.3.1.23 for Trigger frame. Within three bits of Packet Extension subfield, highest index one bit is used for PE Disambiguity while lower index two bits are used for Pre-FEC padding factor. In addition, in order for the clarification of bit mapping, B34-B36 bit order is also written in the table.

**Changes to Section 9.3.1.23**

***To TGax editor:*** ***P44L56 of P802.11ax D1.2*** *replace the current text with the proposed changes below.*

***------------- Begin Text Changes ---------------***

The Packet Extension subfield of the Common Info field indicates the packet extension duration of the HE TB PPDU response. The structure of the Packet Extension subfield of the Common Info field is defined in Figure 9-abc. The subfields of the Packet Extension subfield are defined in Table 9-xyz(Subfields of Packet Extension subfield)(#7672)(#9022)(#9023)(#7521). The PE Disambiguity subfield shall be set to 1 if the condition in Equation (28-113) is met, otherwise it shall be set to 0.(#7675)

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|  | B0 B1 | B2 |
|  | Pre-FEC padding factor | PE Disambiguity |
| Bits: | 2 | 1 |
| **Figure 9-abc—Packet Extension subfield (#7672)(#9022)(#9023)(#7521)(#9488)** |

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| Table 9-xyz Subfields of Packet Extension subfield (#7672)(#9022)(#9023)(#7521)(#9488) |
| Subfield | Meaning | Definition |
| Pre-FEC padding factor | Indicates Pre-FEC padding factor |  Set to 0 to indicate Pre-FEC padding factor value of 4  Set to 1 to indicate Pre-FEC padding factor value of 1 Set to 2 to indicate Pre-FEC padding factor value of 2 Set to 3 to indicate Pre-FEC padding factor value of 3 |
| PE Disambiguity | Indicates PE Disambiguity |  Set to 0 to indicate no PE Disambiguity Set to 1 to indicate PE Disambiguity |

***------------- End Text Changes ---------------***