IEEE P802.11
Wireless LANs

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| Proposed Draft Text: EHT PPE Thresholds field |
| Date: 2021-03-xx |
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Abstract

This submission provides the proposed draft text for **9.4.2.295c.x EHT PPE Thresholds field** in 9.4.2.295c EHT Capabilities element for 802.11be D0.4. The revised contents in this draft indicate the changes compared with the text in 9.4.2.248.5 PPE Thresholds field in 11ax.

The following Motion and SPs are related to this PDT:

[#Motion146]

802.11be agrees to define PPE Thresholds field in EHT Capabilities element.

The existence of the PPE Thresholds field is indicated by the PPE Thresholds Present subfield in the EHT PHY Capabilities Information field.

[#SP394 in 21/208r2]

Do you agree that EHT PPE Thresholds field is defined similarly as 11ax with the following subfields?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | NSS | RU Index Bitmask | PPE Thresholds Info | PPE Pad |
| Bits | 4 | 5 | variable | 0 to 7 |

[SP395 in 21/208r2]

Do you agree with the following table of RU allocation index in EHT PPE Thresholds field?

|  |  |
| --- | --- |
| RU allocation index | RU allocation size |
| 0 | 242 |
| 1 | 484 |
| 2 | 484+242, 996 |
| 3 | 996+484, 996+484+242, 2×996  |
| 4 | 2×996+484, 3×9963×996+484, 4×996 |

[SP397 in 21/208r2]

Do you agree with the following meanings of the Zeros in the Bitmask sequence in RU Index Bitmask subfield?

* For zeros before the first the 1
* Nominal packet padding value = 0 μs
* For zeros after the first 1
* The corresponding constellation index for the missing RU (Bitmask value = 0) shall be the same as the closest smaller RU with PPET defined (Bitmask value = 1)

[SP398 in 21/225r2]

Do you agree that EHT PPE Threshold Info field includes two PPET elements for each case with 1<=NSS<=NSS+1 and RU with value 1 in the RU Index Bitmask:

* PPET8 indicates QAM threshold for nominal packet padding of 8us
* PPETx indicates QAM threshold for next higher nominal packet padding:
* 16us for RU<=996\*2 and Nss<=8 and QAM<=1024
* 20us for other modes

 [SP400 in 21/0225r2]

Do you agree that the EHT Constellation Index table is defined the same as HE Constellation Index table except that value 6 is redefined as 4096-QAM?

**Version history:**

Rev 0: Initial PDT

Rev 1: updated based on review comments on EHT-MCS 14

9.4.2.295c.x EHT PPE Thresholds field

The EHT PPE Thresholds field determines the nominal packet padding value (see 35.xx (Nominal packet padding values selection rules)) for an EHT PPDU of a particular RU allocation size and NSS value. The format of the EHT PPE Thresholds field is defined in Figure x1 (EHT PPE Thresholds field format). (#S394)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B3 | B4 B8 |  |  |
|  | NSS | RU Index Bitmask | PPE Thresholds Info | PPE Pad |
| Bits: | 4 | 5 | variable | 0 to 7 |
| Figure x1―EHT PPE Thresholds field format |

The NSS subfield contains an unsigned integer *NSS* which is used to indicate the scope of NSS*n* for the PPETx NSS*n* RU*b* subfields and PPET8 NSS*n* RU*b* subfields in the PPE Thresholds Info field (1 ≤ *n* ≤ (*NSS* + 1)). The scope of RU*b* for the PPETx NSS*n* RU*b* subfields and PPET8 NSS*n* RU*b* subfields in the PPE Thresholds Info field is given by the RU Index Bitmask subfield.

The RU Index Bitmask subfield contains a bitmask that indicates whether the PPE Thresholds Info field contains PPETx and PPET8 subfields for the five possible RU allocation indices indicated in Table y2 (RU allocation index). The PPETx and PPET8 subfields for RU allocation index *k* are present in the PPE Thresholds Info field only if bit *k* of the RU Index Bitmask subfield (bit 4 + *k* of the EHT PPE Thresholds field) is 1. For example, if B0 of the RU Index Bitmask subfield (B4 of the EHT PPE Thresholds field) is 1, PPETx and PPET8 subfields are present in the PPE Thresholds Info field for the RU allocation size corresponding to RU allocation index 0 (242-tone RU). If B0 of the RU Index Bitmask subfield is 0, PPETx and PPET8 subfields are not present in the PPE Thresholds Info field for the RU allocation size corresponding to RU allocation index 0. The RU Index Bitmask subfield shall contain at least one bit equal to 1. If there exists one or more 0s after the first 1 in the bitmask sequence in the RU Index Bitmask subfield, the PPETx and PPET8 subfields for each RU allocation index corresponding to these 0s are not present, but the PPETx and PPET8 values are present, and the values shall be the same as the PPETx and PPET8 values for the closest smaller RU allocation index with the bitmask value equal to 1 in the RU Bitmask Index subfield. (#S394, #S397, #S398)

The PPE Thresholds Info field contains 6 × (*NSS* + 1) bits, where *NSS* is the value in the NSS field, for every bit in the RU Index Bitmask subfield that is nonzero. The format of the PPE Thresholds Info field is defined in Figure x2 (PPE Thresholds Info field format).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0      B2 | B3      B5 |  |  |  |  |  |  |
|  | PPETx NSS1RU*y* | PPET8NSS1RU*y* | … | PPETx NSS1 RU*m* | PPET8NSS1RU*m* | … | PPETx NSS(*NSS*+1) RU*m* | PPET8 NSS(*NSS*+1) RU*m* |
| Bits: | 3 | 3 |  | 3 | 3 |  | 3 | 3 |
| Figure x2―PPE Thresholds Info field format |

The PPETx and PPET8 subfields for various NSS and RU allocation index values appear in increasing NSS value and increasing RU allocation index value order. Lower numbered PPE Thresholds Info field bits contain PPETx and PPET8 subfields corresponding to lower numbered NSS values. Within a set of PPETx and PPET8 subfields corresponding to a single value of *NSS*, lower numbered PPE Thresholds Info field bits contain PPETx and PPET8 subfields corresponding to lower numbered RU index values. The PPETx NSS*n* RU*b* and PPET8 NSS*n* RU*b* subfields are present for all values of *n* and *b* where 1 ≤ *n* ≤ (*NSS* + 1) and where *b* belongs to the set of RU allocation indexes [*y*, …, *m*] equal to the ordered list of bit positions of all bits that are set to 1 in the RU Index Bitmask subfield, with *y* being the lowest value. (#S398)

Each PPETx NSS*n* RU*b* and PPET8 NSS*n* RU*b* subfield contains an integer as defined in Table y1 (Constellation index), which is used to compute the nominal packet padding value.

|  |
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| Table y1―Constellation index (#S400) |
| Constellation Index | Corresponding Transmission Constellation |
| 0 | BPSK |
| 1 | QPSK |
| 2 | 16-QAM |
| 3 | 64-QAM |
| 4 | 256-QAM |
| 5 | 1024-QAM |
| 6 | 4096-QAM |
| 7 | None |

The value of the PPET8 NSS*n* RU*b* subfield is always less than the value of the PPETx NSS*n* RU*b* subfield, except if the PPET8 subfield is 7.

The RU allocation index for each RU allocation size is defined in Table y2 (RU allocation index). For RU allocation index 2, 3 and 4, more than one RU/MRU shares the same RU allocation index. The RU allocation index for the 80MHz PPDU using EHT-MCS 14 is equal to 2. (#S395)

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| Table y2―RU allocation index (#S395) |
| RU allocation index | RU allocation size |
| 0 | 242 |
| 1 | 484 |
| 2 | 484+242, 996 |
| 3 | 996+484, 996+484+242, 2×996 |
| 4 | 2×996+484, 3×996,3×996+484, 4×996 |

The PPE Pad field contains all 0s. The number of bits in the PPE Pad field is the least number of bits required to round the length of the PPE Thresholds Info field to an integer number of octets.