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Abstract

This submission contains the comment resolution of the following 1 CID related to subclause 35.13 Nominal packet padding values selection rules in 22/0971 IEEE 802.11be LB266 comments.

CID 11882

Revision Notes

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| R0 | Initial revision |

# CID 11882

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| Page.Line | Clause Number | Comment | Proposed Change | Resolution |
| 520.57 | 35.14.2 | Declarative statement in a normative clause. Suggest using normative verbs instead of declarative counterparts wherever necessary throughout this subclause. | As in comment | REVISED.Agree with the commenter.***Instructions to the editor:*** **Please make the changes as shown under CID 11882 in 11-22/1889r0.** |

***Instructions to the editor: please make the following changes to Page 560, Line 36 in the subclause 9.3.1.22.4 EHT Variant User Info field in D2.2 as shown below:***

# 35.13.2 PPET not present in both HE and EHT

An EHT STA that sets the PPE Thresholds Present subfield to 0 in both the EHT and HE Capabilities elements, and the Common Nominal Packet Padding subfield to 0 in the EHT Capabilities element that it transmits shall have a nominal packet padding of 0 µs for all constellations, NSS and large size RU allocations that it supports.

An EHT STA that sets the PPE Thresholds Present subfield to 0 in both the EHT and HE Capabilities elements, and the Common Nominal Packet Padding subfield to 1 in the EHT Capabilities element that it transmits shall have a nominal packet padding of 8 µs for all constellations, NSS and large size RU allocations that it supports (#11883)(see 36.3.2.2 (Subcarriers and resource allocation for multiple RUs)).

An EHT STA that sets the PPE Thresholds Present subfield to 0 in both the EHT and HE Capabilities elements, and the Common Nominal Packet Padding subfield to 2 in the EHT Capabilities element that it transmits shall have a nominal packet padding of 16 µs for all constellations, NSS and large size RU allocations that it supports.

An EHT STA that sets the PPE Thresholds Present subfield to 0 in both the EHT and HE Capabilities elements, and the Common Nominal Packet Padding subfield to 3 in the EHT Capabilities element that it transmits shall have a nominal packet padding of 16 µs for all modes with constellation order up to 1024-QAM, NSS less than or equal to 8, and large size RU or MRU size less than or equal to 2×996, and a nominal packet padding of 20 µs for all the other modes with a large size RU or MRU that the STA supports.

An EHT STA that sets the PPE Thresholds Present subfield to 0 in both the EHT and HE Capabilities elements shall have a nominal packet padding of 0 µs for a small size RU or MRU (see 36.3.2.2 (Subcarriers and resource allocation for multiple RUs)), if 4096-QAM is not used for the RU or MRU; or if the RU size is 106 or the MRU size is 106+26 and EHT-MCS 15 is not applied to them. An EHT STA that sets the PPE Thresholds Present subfield to 0 in both the EHT and HE Capabilities elements shall have a nominal packet padding value indicated by the Common Nominal Packet Padding subfield in the EHT Capabilities element for a small size RU or MRU, if 4096-QAM is used for the RU or MRU(#10402); or if the RU size is 106 or the MRU size is 106+26 and EHT-MCS 15 is applied to them. For example, in the case of the Common Nominal Packet Padding subfield set to 3, the nominal packet padding of 20 µs is used for the small size RU or MRU modulated with 4096-QAM, and the nominal packet padding of 16 µs is used if the RU size is 106 or the MRU size is 106+26 and EHT-MCS 15 is applied to the RU or MRU.

The rule to select the (#10398)EHT common nominal packet padding value, in the case of the PPE Thresholds Present subfield set to 0 in both the EHT and HE Capabilities elements, is described in [Table 35-](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark135) [4 (EHT nominal packet padding indication when the PPE Thresholds Present subfield is set to 0 in both the](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark135) [EHT and HE Capabilities elements)](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark135).

**Table 35-4—EHT nominal packet padding indication when the PPE Thresholds Present sub- field is set to 0 in both the EHT and HE Capabilities elements**

|  |  |  |  |
| --- | --- | --- | --- |
| **EHT-MCS** | **RU or MRU** size**< 106 tones** | **106-tone RU and 106+26-tone MRU** | **RU or MRU size**≥ **242 tones** |
| 0–11 | 0 µs | 0 µs | EHT common nominal packet padding value |
| 12 and 13 | EHT common nominal packet padding value | EHT common nominal packet padding value | EHT common nominal packet padding value |
| 14 | — | — | EHT common nominal packet padding value |
| 15 | 0 µs | EHT common nominal packet padding value | EHT common nominal packet padding value |
| NOTE—EHT common nominal packet padding value is the value conveyed by the Common Nominal Packet Padding subfield in the EHT PHY Capabilities Information field in the EHT Capabilities element. |

# 35.13.3 PPET not present in EHT but present in HE

An EHT STA that sets the PPE Thresholds Present subfield to 0 in the EHT Capabilities element, and sets it to 1 in the HE Capabilities element that it transmits, indicates that the nominal packet padding requirement for an EHT transmission (#11884)with a mode covered in the PPE Thresholds field in the HE Capabilities element, shall be the same as for the corresponding HE transmission. The mode covered in the PPE Thresholds field in the HE Capabilities element satisfies the following rules:

* *NSS* shall be in the scope from 1 to *NSTS* + 1, where *NSTS* is indicated in the NSTS subfield in the HE Capabilities element;
* The RU sizes shall be in the scope of ([242, 484, 996, 2×996]) corresponding to the RU Index Bitmask subfield in the HE Capabilities element, including the RU size corresponding to 0 in the RU Index Bitmask subfield in the HE Capabilities element;
* The constellation index shall be less than 6.

The nominal packet padding for EHT-MCS 14 or 15 for a large size RU of size 2×996 or smaller shall be the same as that for HE-MCS 0 with DCM = 1 for the same RU size. The nominal packet padding shall be 0 µs for a small size RU or MRU, except for the following cases: 4096-QAM is used for the RU or MRU; or EHT-MCS 15 is used for an RU of size 106 or MRU of size 106+26. The nominal packet padding for EHT-MCS 15 for an RU of size 106 or MRU of size 106+26 shall be the same as that of HE-MCS 0 with DCM = 1 for RU size 106. The nominal packet padding for the following modes shall follow the rules indicated by the Common Nominal Packet Padding subfield in the EHT Capabilities element:

* For all modes with *NSS* greater than (*NSTS* + 1), the corresponding nominal packet padding shall follow the rules indicated by the Common Nominal Packet Padding subfield.
* For all modes with RU size greater than 2×996, the corresponding nominal packet padding shall follow the rules indicated by the Common Nominal Packet Padding subfield.
* For all modes with 4096-QAM, the corresponding nominal packet padding shall follow the rules indicated by the Common Nominal Packet Padding subfield.

The nominal packet padding values for 484+242-tone MRU shall be the same as for 996-tone RU derived above, and the nominal packet padding values for 996+484-tone MRU and 996+484+242-tone MRU shall be the same as for 2×996-tone RU derived above, in the case of the PPE Thresholds Present subfield set to 0 in the EHT Capabilities element and 1 in the HE Capabilities element. The nominal packet padding indicated by the Common Nominal Packet Padding subfield in the EHT Capabilities element shall be greater than or equal to the largest nominal packet padding values among all the modes indicated in the PPE Thresholds field in the HE Capabilities element.

The inheritance rule to select the EHT nominal packet padding value for *NSS* ≤ *NSTS* + 1 and RU or MRU ≤ 2×996, in the case of the PPE Thresholds Present subfield set to 0 in the EHT Capabilities element and 1 in the HE Capabilities element, is described in [Table 35-5 (EHT nominal packet padding indication for NSS ≤](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark136) [NSTS+1 when the PPE Thresholds Present subfield is set to 0 in the EHT Capabilities element and 1 in the](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark136) [HE Capabilities element)](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark136).

**Table 35-5—EHT nominal packet padding indication for *NSS* ≤ *NSTS*+1 when the PPE Thresholds Present subfield is set to 0 in the EHT Capabilities element and 1 in the HE Capabilities element**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EHT-MCS** | **RU or MRU size****< 106 tones** | **106-tone RU and 106+26-tone MRU** | **242 tones****≤ RU or MRU size****≤ 2**×**996 tones** | **RU or MRU size****> 2**×**996 tones** |
| 0–11 | 0 µs (see NOTE 1) | 0 µs (see NOTE 1) | HE nominal packet padding value | EHT nominal packet padding value |
| 12 and 13 | EHT nominal packet padding value | EHT nominal packet padding value | EHT nominal packet padding value | EHT nominal packet padding value |
| 14 | — | — | HE nominal packet padding value for HE-MCS 0 + DCM (see NOTE 4) | EHT nominal packet padding value (see NOTE 4) |

**Table 35-5—EHT nominal packet padding indication for *NSS* ≤ *NSTS*+1 when the PPE Thresholds Present subfield is set to 0 in the EHT Capabilities element and 1 in the HE Capabilities element *(continued)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EHT-MCS** | **RU or MRU size****< 106 tones** | **106-tone RU and 106+26-tone MRU** | **242 tones****≤ RU or MRU size****≤ 2**×**996 tones** | **RU or MRU size****> 2**×**996 tones** |
| 15 | 0 µs (see NOTE 1) | HE nominal packet padding value for HE-MCS 0 + DCM | HE nominal packet padding value for HE-MCS 0 + DCM | EHT nominal packet padding value |
| NOTE 1—The nominal packet padding value conveyed by the PPE Thresholds field in the HE Capabilities element is 0 µs in these cases.NOTE 2—HE nominal packet padding value is the value conveyed by the PPE Thresholds field in the HE Capabilities element.NOTE 3—EHT common nominal packet padding value is the value conveyed by the Common Nominal Packet Padding subfield in the EHT PHY Capabilities Information field in the EHT Capabilities element.NOTE 4—(#10339)EHT-MCS 14 only applies to 80 MHz, 160 MHz, and 320 MHz EHT MU PPDUs, and the nominal packet padding value can be taken from the values for 996-, 2×996-, and 4×996-tone RUs, respectively. |

# 35.13.4 PPET present in EHT(#10392)

An EHT STA that sets the PPE Thresholds Present subfield to 1 in the EHT Capabilities element that it transmits shall indicate its nominal packet padding per constellation, NSS and RU allocation by setting the subfields of the EHT PPE Thresholds field according to 9.4.2.313.5 (EHT PPE Thresholds field) and using the corresponding values from dot11EHTPPEThresholdsMappingsTable. The nominal packet padding values for an EHT STA that sets the PPE Thresholds Present subfield to 1 in the EHT Capabilities element that it transmits shall be only determined by the EHT PPE Thresholds field.

After receiving the EHT PPE Thresholds field from a second STA, the first STA shall use the combination of the PPETmax NSS*n* RU*b* subfield and PPET8 NSS*n* RU*b* subfield values to determine the nominal packet padding for EHT PPDUs that are transmitted to the second STA using NSS = *n* and an RU allocation corresponding to RU allocation index *b*, for each value of NSS and RU specified by the field. The nominal packet padding shall be used in computing the PE field duration (see 36.3.14 (Packet extension)).

NOTE—If the pre-FEC padding factor is 4, then the value of nominal *TPE* is equal to the nominal packet padding (see Table 36-61 (Nominal TPE values)).

The nominal packet padding as a function of the PPE thresholds, the number of spatial streams and the RU allocation index is described in [Table 35-6 (PPE thresholds per PPET8 and PPETmax)](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark137).

In [Table 35-6 (PPE thresholds per PPET8 and PPETmax)](file:///C%3A%5CUsers%5Ch00517318%5CDesktop%5CTGbe_Cl_35.doc#bookmark137), “RU Allocation index = (b + DCM)” means the following. With the exception of an RU or MRU indicated by the RU allocation index equal to 3 or 4, if EHT-MCS 14 or EHT-MCS 15 is applied in a given RU, the nominal packet padding value shall be based on the next larger RU allocation index (RU allocation index + 1). (#11885)Examples of the selection of the RU allocation index considering DCM include:

* If EHT-MCS 15 is applied to a 242-tone RU then the nominal packet padding value for a 484-tone RU shall be used.
* If EHT-MCS 15 is applied to a 106-tone RU or a 106+26-tone MRU then the nominal packet padding value for a 242-tone RU shall be used.
* If EHT-MCS 15 is applied to an RU or MRU indicated by the RU allocation index equal to 3 or 4, then the nominal packet padding value for the same RU or MRU shall be used.

**Table 35-6—PPE thresholds per PPET8 and PPETmax**

|  |  |  |
| --- | --- | --- |
| **Result of comparison of the constellation index *c* of an EHT PPDU with NSS value *n* and RU allocation size that corresponds to the RU allocation index = (*b* + DCM) to the PPET8 NSS*n* RU(*b* + DCM) value** | **Result of comparison of the constellation index *c* of an EHT PPDU with NSS value *n* and RU allocation size that corresponds to the RU allocation index = value (*b*****+ DCM) to the PPETmax NSS*n* RU(*b* + DCM) value** | **Nominal packet padding for an EHT PPDU transmitted to this STA using the constellation index****= *c*, NSS = *n* and RU allocation size that corresponds to the RU allocation index = (*b* + DCM)** |
| *c* greater than or equal to PPET8 | *c* less than PPETmax or PPETmax equal to None | 8 µs |
| *c* greater than PPET8 or PPET8 equal to None | *c* greater than or equal to PPETmax | 16 µs if *c* ≤ 5 and (*b* + DCM) ≤ 3 and *n* ≤ 8 |
| 20 µs if *c* = 6, or (*b* + DCM) = 4 or *n*> 8 |
| All other cases with PPET8 and PPETmax values (#10400)present | 0 µs |
| NOTE 1—DCM = 1 if *b* is less than 3 and EHT-MCS 14 or EHT-MCS 15 is used; DCM = 0 otherwise.NOTE 2—If there exists one or more 0s before the first 1 in the bitmask sequence in the RU Index Bitmask subfield, the nominal packet padding is 0 µs for each RU allocation index corresponding to these 0s.NOTE 3—If there exists one or more 0s after the first 1 in the bitmask sequence in the RU Index Bitmask subfield, the PPETmax and PPET8 values for each RU allocation index corresponding to these 0s shall be the same as the PPETmax and PPET8 values for the closest smaller RU allocation index with the bitmask value equal to 1 in the RU Index Bitmask subfield.NOTE 4—The nominal packet padding value is 16 µs for all supported RU or MRU sizes and constellations if the number of spatial streams of the EHT PPDU transmission is greater than (*NSS\_PE* + 1) and less than or equal to 8, where *NSS\_PE* is the value in the NSS\_PE subfield. |

* If EHT-MCS 14 is applied, the RU allocation indices (*b* + DCM) for the 80 MHz, 160 MHz, and 320 MHz PPDUs shall be equal to 3, 3, and 4, respectively.

The PPETmax and PPET8 subfields for RU allocation index *k* shall be 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. When there exists one or more 0s before the first 1 in the bitmask sequence in the RU Index Bitmask subfield, the PPETmax and PPET8 subfields for each RU allocation index corresponding to these 0s shall not be present, and the nominal packet padding value shall be 0 µs for these RU(s) or MRU(s). For example, if the bitmask sequence of RU Index Bitmask subfield is [0 0 1 1 1], the nominal packet padding value shall be 0 µs for the 242-tone RU and 484-tone RU.

When there exists one or more 0s after the first 1 in the bitmask sequence in the RU Index Bitmask subfield, the PPETmax and PPET8 subfields for each RU allocation index corresponding to these 0s shall not be present, but the PPETmax and PPET8 values shall be present, and the values shall be the same as the PPETmax and PPET8 values for the closest smaller RU allocation index with the bitmask value equal to 1 in the RU Index Bitmask subfield. For example, if the bitmask sequence of RU Index Bitmask subfield is [1 0 0 1 1], the PPETmax and PPET8 values for 484-tone RU, 484+242-tone MRU, and 996-tone RU shall be the same as for the 242-tone RU.

The PPETmax and PPET8 subfields for an NSS value *n* shall be present only if *n* is less than or equal to (*NSS\_PE* + 1), where *NSS\_PE* is the value in the NSS\_PE subfield in the EHT PPE Thresholds field of the EHT Capabilities element. When the number of spatial streams of the EHT PPDU transmission is greater than (*NSS\_PE* + 1) and less than or equal to 8, the nominal packet padding value shall be 16 µs for all supported RU or MRU sizes and constellations.

An EHT STA that sets the PPE Thresholds Present subfield to 1 in the EHT Capabilities element shall have a nominal packet padding of 0 µs for a small size RU or MRU, if 4096-QAM is not used for the RU or MRU; or if the RU size is 106 or the MRU size is 106+26 and EHT-MCS 15 is not applied to (#10402)them. An EHT STA that sets the PPE Thresholds Present subfield to 1 in the EHT Capabilities element shall have a nominal packet padding value the same as the value for the 242-tone RU, if 4096-QAM is used for the RU or MRU; or if the RU size is 106 or the MRU size is 106+26 and EHT-MCS 15 is applied to (#10402)them.

# 35.13.5 STA behavior related to nominal packet padding

A STA transmitting an EHT MU PPDU shall provide the nominal packet padding in the TXVECTOR parameter NOMINAL\_PACKET\_PADDING for the minimal PE calculation (see 36.3.14 (Packet extension)).

The nominal packet padding value for a broadcast RU or MRU contained in an EHT PPDU that a STA transmits shall be set to 20 µs if the RU or MRU is modulated with 4096-QAM, or the RU or MRU is greater than 2×996, (#12151)and shall be set to 16 µs for all other modes. A STA transmitting an EHT PPDU that carries a broadcast frame shall not set the value of the TXVECTOR parameter NOMINAL\_PACKET\_PADDING to a value that is less than that required for any of the recipients and the broadcast RU or MRU. A STA transmitting an EHT PPDU that carries a group addressed, but not broadcast, frame shall not set the value of the TXVECTOR parameter NOMINAL\_PACKET\_PADDING to a value that is less than that required for any of the recipients in the group.

If a STA A is transmitting an EHT MU PPDU to a STA B, where the STA A has not received a frame including the EHT Capabilities element from the STA B, then the STA A shall set the value of the TXVECTOR parameter NOMINAL\_PACKET\_PADDING to:

* 20 µs if the RU or MRU is modulated with 4096-QAM, the RU or MRU size is greater than 2×996- tone(#12151).
* 16 µs otherwise.

NOTE—One such situation is an AP transmitting to a nonassociated STA. Another such situation is a nonassociated STA transmitting to an AP without having received a management frame including an EHT Capabilities element from the AP, such as a Beacon or Probe Response frame.

A STA transmitting an EHT MU PPDU to a receiving STA shall include post-FEC padding determined by the pre-FEC padding factor (see 36.3.13 (Data field)) and after including the post-FEC padding, the transmitting STA shall include a packet extension with a duration computed based on the TXVECTOR parameter NOMINAL\_PACKET\_PADDING (see 36.3.14 (Packet extension)).