### **IEEE P802.11 Wireless LANs**

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| PDT EHT PHY Capabilities Information Field | | | | |
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**Introduction**

This document provides proposed draft text for Subclause 9.4.2.XXX EHT PHY Capabilities in IEEE 802.11be D0.3.

The following Motions apply to this PDT:

Motion 111: #SP0611-21

Motion 112: #SP12, #SP13

Motion 115: #SP75

Motion 124: #SP176, #SP177, #SP178, #SP179, #SP180, #SP181, #SP182

Motion 135: #SP224

Motion 137: #SP259, #SP269, #SP270, #SP278, #SP279, #SP280, #SP281, #SP284

Motion 141: #SP260, #SP261

Motion 142: #SP296

Motion 144, #SP319, #SP320

Motion 146: #SP334, #SP338, #SP339

R0: Initial proposed draft text.

**Motions**

802.11be shall define 4096 QAM as one of the optionally supported modulations.

[Motion 111, #SP0611-21, [19] and [57]]

For the combined multiple RU with the combined RU size less than 242 tones, the BCC can be supported.

* Mandatory or Optional for BCC, TBD.
* Only for modulation up to 256 QAM (with or without DCM – if defined in 802.11be).
* Only for NSS ≤ 4.

[Motion 112, #SP12, [19] and [28]]

802.11be supports that 80 MHz and 160 MHz operating STA shall be able to participate in a higher BW DL and UL OFDMA transmission.

* STA shall be able to decode the preamble and its assigned RU (some restrictions TBD).
* No capability bit as in 802.11ax.

[Motion 115, #SP75, [16] and [25]]

For a single RU less than or equal to 242 tones (i.e., RU26, RU52, RU106, RU242), the BCC can be supported.

* Mandatory or Optional for BCC, TBD.
* Only for modulation up to 256 QAM (with or without DCM – if defined in 802.11be).
* Only for NSS ≤ 4.

[Motion 112, #SP13, [19] and [28]]

802.11be devices shall mandatorily support the following modulation order:

* Up to 64 QAM for 20 MHz-only non-AP STA (if defined in EHT).
* Up to 256 QAM for all other devices.

[Motion 124, #SP176, [1] and [2]]

Mandatory support requirement of LDPC in 802.11be is the same as in 802.11ax.

[Motion 124, #SP177, [1] and [2]]

802.11be AP is mandatory to support the following:

* 160 MHz operating channel width in 6 GHz band
* 80 MHz operating channel width in 5 GHz band
* 20 MHz operating channel width in 2.4 GHz band

NOTE – “soft AP” is TBD.

[Motion 124, #SP178, [1] and [2]]

It is mandatory for a non-AP STA to support 80 MHz operating channel width in 5 and 6 GHz bands.

* Except for 20 MHz only client (if defined in EHT).

[Motion 124, #SP179, [1] and [2]]

802.11be defines 20 MHz-only client in 2.4/5 GHz band only.

[Motion 124, #SP180, [1] and [2]]

802.11be agrees with the following MU-MIMO support.

* DL MU-MIMO
  + Mandatory support for AP with ≥ 4 antennas.
  + Mandatory support for STA.
  + Mandatory for non-OFDMA on all RU/MRU size ≥ 242 in supported bandwidth.
  + Optional for OFDMA+MU-MIMO operation.
* UL MU-MIMO
  + Mandatory support for AP with ≥ 4 antennas.
  + Mandatory support for STA.
  + Mandatory for non-OFDMA on all RU/MRU size ≥ 242 in supported bandwidth.
  + Optional for OFDMA+MU-MIMO operation.

[Motion 124, #SP181, [1] and [2]]

[Motion 137, #SP284, [3] and [44]]

Support of Nss\_total = 4 is mandatory for 802.11be STA in receiving both sounding NDP and DL MU-MIMO, i.e., beamformee STS capability.

[Motion 124, #SP182, [1] and [2]]

The Ng mandatory/optional support requirement is the same as in 802.11ax.

* NOTE – This is for R1.

[Motion 135, #SP224, [48] and [147]]

Three PHY capability fields are defined to indicate the maximum supported number of EHT-LTFs of an EHT STA.

* One bit to indicate the support of extra LTFs for non-OFDMA PPDU.
* One field to indicate the maximum number of LTFs supported for data transmission to non-OFDMA single user.
  + NOTE – Larger than or equal to Nss capability.
* One field to indicate the maximum number of LTFs supported for data transmission to multiple users.
  + NOTE – Larger than or equal to beamformee Nss capability.

[Motion 137, #SP259, [3] and [52]]

The EHT nominal packet padding has two capability bits that are defined as follows.

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| --- | --- |
| Nominal packet padding | Encoding |
| 0 | Set to 0 if the nominal packet padding is 0 μs for all constellations, NSS and RU allocations the STA supports. |
| 1 | Set to 1 if the nominal packet padding is 8 μs for all constellations, NSS and RU allocations the STA supports. |
| 2 | Set to 2 if the nominal packet padding is 16 μs for all constellations, NSS and RU allocations the STA supports. |
| 3 | Set to 3 if the nominal packet padding is 16 μs for all modes with constellation ≤ 1024, NSS ≤ 8 and RU ≤ 2×996, and 20 µs for all other modes the STA supports. |

[Motion 137, #SP269, [3] and [142]]

242-tone RUs may be allocated to 20 MHz operating STAs for 40 / 80 / 160 / 320 MHz DL OFDMA.

* 80+80 / 160+160 MHz is TBD.
* NOTE 1 – For Downlink OFDMA, receiving 242-tone RUs is optional for 20 MHz operating STAs.
* NOTE 2 – UL OFDMA case is TBD.

This is for R1.

[Motion 137, #SP270, [3] and [42]]

For non-AP STA, it is mandatory to support the following:

* In OFDMA Rx, any preamble puncturing pattern allowed by Motion 131, #SP195.
* In non-OFDMA Tx and Rx, any preamble puncturing pattern needed to support mandatory MRU for non-OFDMA as specified in subclause 36.3.2.3.3 in D0.1.

For AP, it is mandatory to support the following:

* In OFDMA Tx and non-OFDMA Tx and Rx, any preamble puncturing pattern that needs to be supported for mandatory MRU in non-OFDMA as specified in subclause 36.3.2.3.3 in D0.1.

[Motion 137, #SP278, [3] and [44]]

The followings are the requirements to support DCM+MCS0:

* Mandatory in
  + RU 26, 52, 106, and 242 for 20 MHz-only STAs.
  + RU 26, 52, 106, 242, 484, and 996 for non-20 MHz-only STAs.
* Conditional mandatory in
  + RU 2×996 when STA supports 160 MHz.
  + RU 2×996 and 4×996 when STA supports 320 MHz.
* Optional in
  + MRU 52+26, 106+26, 484+242, 996+484, 996+484+242, and 3×996.
* Not supported in
  + MRU 2×996+484, 3×996+484.

[Motion 137, #SP279, [3] and [44]]

The optional Dup+DCM mode for 6 GHz band LPI channel is supported.

[Motion 137, #SP280, [3] and [44]]

The following mandatory/optional support requirements of LTF+GI combinations are supported.

* MU PPDU
  + 2× LTF + 0.8 μs GI (M).
  + 2× LTF + 1.6 μs GI (M).
  + 4× LTF + 3.2 μs GI (M).
  + 4× LTF + 0.8 μs GI (O).
* TB PPDU
  + 2× LTF+1.6 μs GI (M).
  + 4× LTF + 3.2 μs GI (M).
  + 1× LTF + 1.6 μs GI (M).
  + NOTE – 1× LTF + 1.6 μs GI only for non-OFDMA transmission.
* NDP
  + 2× LTF + 0.8 μs GI (M).
  + 2× LTF + 1.6 μs GI (M).
  + 4× LTF + 3.2 μs GI (O).

[Motion 137, #SP281, [3] and [44]]

The allowed values of maximum NLTF receive capability for single-user transmission are 4, 8, and 16.

NOTE – The value of maximum NLTF = 16 is available in R2.

[Motion 141, #SP260, [3] and [52]]

The allowed values of maximum NLTF receive capability for multiple-user transmission are 4, 8, and 16.

* NOTE 1 – This capability is for both OFDMA and non-OFDMA MU-MIMO transmission.
* NOTE 2 – The value of maximum NLTF = 16 is available in R2.

[Motion 141, #SP261, [3] and [52]]

802.11be agrees that

* the number of EHT-LTF in NDP transmissions can be larger than the initial number of EHT-LTF determined by Nss;
* the support of extra LTF in NDP is optional for beamformee;
* the same capability fields for non-OFDMA data transmission to multiple users applies to NDP:
  + The support of extra LTF is claimed by the capability bit of “Extra LTFs support for non-OFDMA PPDU”;
  + The supported maximum number of EHT-LTFs in NDP is claimed by the capability field of “maximum number of LTFs supported for non-OFDMA data transmission to multiple users and NDP”.

[Motion 142, #SP296, [53] and [54]]

The beamformee support of receiving NDP with bandwidth wider than the STA’s operating BW is

* mandatory for STAs with operating BW ≥ 80 MHz.
* optional for STAs with operating BW = 20 MHz.

[Motion 144, #SP319, [35] and [148]]

It is mandatory for beamformee to support all partial bandwidth feedback modes aligned with the large RU/MRU.

[Motion 144, #SP320, [35] and [148]]

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

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

[Motion 146, #SP334, [23] and [325]]

The max supported HE BW capability indicated in the HE Capabilities element by an EHT STA is no more than the max supported EHT BW capability indicated in the EHT Capabilities element by the EHT STA.

* When the max supported EHT BW capability indicated in the EHT Capabilities element by an EHT STA is no more than 160 MHz, the max supported HE BW capability indicated in the HE Capabilities element by the EHT STA is the same as the max supported EHT BW capability indicated in the EHT Capabilities element.
* When the max supported EHT BW capability indicated in the EHT Capabilities element by an EHT STA is 320 MHz, the max supported HE BW capability indicated in the HE Capabilities element by the EHT STA is 160 MHz.

[Motion 146, #SP338, [23] and [326]]

At any BW+MCS allowed by HE, the max supported HE Nss capability indicated in the HE Capabilities element (Nss for transmitting HE PPDU) by an EHT STA/AP is no more than the max supported EHT Nss capability indicated in the EHT Capabilities element (Nss for transmitting EHT PPDU) by the EHT STA.

* When the max supported EHT Nss capability indicated in the EHT Capabilities element by an EHT STA at a BW+MCS is no more than 8, the max supported HE Nss capability indicated in the HE Capabilities element by the EHT STA is the same as the max supported EHT Nss capability indicated in the EHT Capabilities element at the BW+MCS.
* When the max supported EHT Nss capability indicated in the EHT Capabilities element by an EHT STA at a BW+MCS is more than 8, the max supported HE Nss capability indicated in the HE Capabilities element by the EHT STA at the BW is 8 at the BW+MCS.

[Motion 146, #SP339, [23] and [326]]

Note to the Reader: Much of the PDT shows a redline compared to 802.11ax; however, the figure for the EHT PHY Capabilities Information field format is show “clean” without redline, to make it easier to read.

9.4.2.XXX.X EHT PHY Capabilities Information field

The format of the EHT PHY Capabilities Information field is defined in Figure 9-F1 (EHT PHY Capabilities Information field format).

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|  | B0 | B1       B7 | B8 | B9 | B10 | B11 |
|  | Reserved | Supported Channel Width Set | Device Class | LDPC Coding In Payload | NDP With 4x EHT-LTF And 3.2 µs GI | Partial Bandwidth UL  MU-MIMO |
| Bits: | 1 | 7 | 1 | 1 | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- |
|  | B12 | B13 | B14 | B15       B37 | B18         B20 | B21 B23 |
|  | SU Beamformer | SU Beamformee | MU Beamformer | Beamformee SS ≤ 80 MHz | Beamformee SS =160 MHz | Beamformee SS = 320 MHz |
| Bits: | 1 | 1 | 1 | 3 | 3 | 3 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B24      B25 | B26         B28 | B29 | B30 | B31 | B32 | B33 |
|  | Number Of Sounding Dimensions ≤ 80 MHz | Number Of Sounding Dimensions =160MHz | Ng = 16 SU Feedback | Ng = 16 MU Feedback | Codebook Size (ϕ, ψ) = {4, 2} SU Feedback | Codebook Size (ϕ, ψ) = {7, 5} MU Feedback | Triggered SU Beamforming Feedback |
| Bits: | 3 | 3 | 1 | 1 | 1 | 1 | 1 |

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|  | B34 | B35 | B36 | B37 | B38 | B39 | B40 B42 |
|  | Triggered CQI Feedback | Partial Bandwidth DL  MU-MIMO | PPE Thresholds Present | PSR-based SR Support | Power Boost Factor Support | EHT MU PPDU With 4x HE-LTF And 0.8 µs GI | Max Nc |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 3 |

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|  | B43    B44 | | B45 B49 | | B50 | | B51 |
|  | Nominal Packet Padding | | Maximum number of supported EHT-LTFs | | Support of BPSK-DCM | | Support of EHT-DUP in 6 GHz |
| Bits: | 2 | | 5 | | 1 | | 1 |
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The subfields of the EHT PHY Capabilities Information field are defined in Table 9-T1 (Subfields of the EHT PHY Capabilities Information field).

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| Table 9-T1 Subfields of the EHT PHY Capabilities Information field | | |
| Subfield | Definition | Encoding |
| Supported Channel Width Set | In the 2.4 GHz band:   * B0 indicates support for a 40 MHz channel width * B1, B2, and B3 are reserved * B4 is reserved * B5 and B6 are reserved   In the 5 GHz band:   * B0 is reserved * B1 indicates support for a 40 MHz and 80 MHz channel width * B2 indicates support for a 160 MHz channel width * B3 is reserved * B4 is reserved * B5 indicates support of 242-tone RUs in a * 40 MHz, 80 MHz, and 160 MHz EHT MU PPDU if a non-AP STA operates with 20 MHz channel width * otherwise B5 is reserved(#24435) * B6 is reserved   In the 6 GHz band:   * B0 is reserved * B1 indicates support for a 40 MHz and 80 MHz channel width * B2 indicates support for a 160 MHz channel width * B3 indicates support for a 320 MHz channel width * B4 is reserved * B5 indicates support of 242-tone RUs in a * 40 MHz, 80 MHz, 160 MHz and 320 MHz EHT MU PPDU if a non-AP STA operates with 20 MHz channel width. * otherwise B5 is reserved(#24435) * B6 is reserved | B0 is set to 0 if not supported. B0 is set to 1 if supported.  B1 is set to 0 if not supported, i.e., it indicates a 20 MHz-only non-AP EHT STA in the 5 GHz band. B1 is set to 1 if supported.  B2 is set to 0 if not supported. B2 is set to 1 if supported. If B2 is 1, then B1 is set to 1.  B3 is set to 0 if not supported. B3 is set to 1 if supported. If B3 is 1, then B2 is set to 1.  B4 is set to 0 if not supported. B4 is set to 1 if supported.  B5 is set to 0 if not supported. B5 is set to 1 if supported.  .  NOTE 1 – If B1 is set to 1, then B1 in Table 9-322b shall be set to 1. If B2 is set to 1 then B2 in Table 9-322b shall be set to 1. |
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| Device Class | For a non-AP STA, indicates whether the STA is a Class A or a Class B device. | For a non-AP STA:  Set to 1 for a Class A device.  Set to 0 for a Class B device.  Reserved for an AP. |
| LDPC Coding In Payload | Indicates support for the transmission and reception of LDPC encoded PPDUs. | Set to 0 if not supported.  Set to 1 if supported.  NOTE—Set to 1 by a STA that supports more than 4 spatial streams, an EHT PPDU bandwidth greater than 20 MHz, EHT-MCS 10, EHT-MCS 11, EHT-MCS 12, or EHT-MCS 13. |
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| NDP With 4x EHT-LTF And 3.2 µs GI | For a beamformee, indicates support for receiving an EHT sounding NDP with 4x EHT-LTF and 3.2 µs guard interval duration. | If the SU Beamformee field is 1:  Set to 0 if not supported.  Set to 1 if supported. |
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| Partial Bandwidth UL MU-MIMO | For an AP, indicates support for receiving an EHT TB PPDU on an RU/MRU where MU-MIMO is employed and where the RU/MRU does not span the entire non-punctured portion of the PPDU bandwidth (UL MU-MIMO in OFDMA).  For a non-AP STA, indicates support for transmitting an EHT TB PPDU on an RU/MRU where MU-MIMO is employed and where the RU/MRU does not span the entire non-punctured portion of the PPDU bandwidth (UL MU-MIMO in OFDMA).  NOTE—The RU/MRU is a 242-tone or larger RU. | Set to 0 if not supported.  Set to 1 if supported. |
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| SU Beamformer | Indicates support for operation as an SU beamformer. | Set to 0 if not supported.  Set to 1 if supported.  NOTE—Set to 1 by an AP with support for 4 or more spatial streams. |
| SU Beamformee | Indicates support for operation as an SU beamformee. | For an AP:  Set to 0 if not supported.  Set to 1 if supported.  Set to 1 for a non-AP STA. |
| MU Beamformer | Indicates support for operation as an MU beamformer. | For an AP:  Set to 0 if not supported.  Set to 1 if the SU Beamformer field is 1 and operation as an MU beamformer is supported.  Set to 0 for a non-AP STA.  NOTE—Set to 1 by an AP with support for 4 or more spatial streams. |
| Beamformee SS ≤ 80 MHz | For a PPDU bandwidth less than or equal to 80 MHz, indicates the maximum number of spatial streams that the STA can receive in an EHT sounding NDP, which is also the maximum total number of spatial streams over all the users that can be sent in a DL MU-MIMO transmission on an RU/MRU that includes that STA, where the RU/MRU might or might not span the entire PPDU bandwidth. | If the SU Beamformee subfield is 1:  Set to the maximum number of spatial streams that the STA is capable of receiving in an EHT sounding NDP minus 1. The minimum value of this field is 3.  Reserved if the SU Beamformee field is 0. |
| Beamformee SS = 160 MHz | For a PPDU bandwidth of 160 MHz, indicates the maximum number of spatial streams that the STA can receive in an EHT sounding NDP, which is also the maximum total number of spatial streams over all the users that can be sent in a DL MU-MIMO transmission on an RU/MRU that includes that STA, where the RU/MRU might or might not span the entire PPDU bandwidth. | If the SU Beamformee subfield is 1:  Set to the maximum number of spatial streams that the STA is capable of receiving in an EHT sounding NDP minus 1. The minimum value of this field is 3.  Reserved if the SU Beamformee subfield is 0 or the Supported Channel Width Set field does not indicate support for 160 MHz. |
| Beamformee SS = 320 MHz | For a PPDU bandwidth of 320 MHz, indicates the maximum number of spatial streams that the STA can receive in an EHT sounding NDP, which is also the maximum total number of spatial streams over all the users that can be sent in a DL MU-MIMO transmission on an RU/MRU that includes that STA, where the RU/MRU might or might not span the entire PPDU bandwidth. | If the SU Beamformee subfield is 1:  Set to the maximum number of spatial streams that the STA is capable of receiving in an EHT sounding NDP minus 1. The minimum value of this field is 3.  Reserved if the SU Beamformee subfield is 0 or the Supported Channel Width Set field does not indicate support for 320 MHz. |
| Number Of Sounding Dimensions ≤ 80 MHz | For bandwidth less than or equal to 80 MHz, it indicates the beamformer’s capability indicating the maximum value of the TXVECTOR parameter NUM\_STS for an EHT sounding NDP. | If the SU Beamformer subfield is 1:  Set to the supported maximum TXVECTOR parameter NUM\_STS value minus 1.  Reserved if the SU Beamformer subfield is 0. |
| Number Of Sounding Dimensions = 160 MHz | For bandwidth of 160 MHz, indicates the beamformer’s capability indicating the maximum value of the TXVECTOR parameter NUM\_STS for an EHT sounding NDP. | If the SU Beamformer subfield is 1:  Set to the supported maximum TXVECTOR parameter NUM\_STS value minus 1.  Reserved if the SU Beamformer subfield is 0 or the Supported Channel Width Set field does not indicate support for bandwidth of 160 MHz. |
| Number Of Sounding Dimensions = 320 MHz | For bandwidth of 320 MHz, indicates the beamformer’s capability indicating the maximum value of the TXVECTOR parameter NUM\_STS for an EHT sounding NDP. | If the SU Beamformer subfield is 1:  Set to the supported maximum TXVECTOR parameter NUM\_STS value minus 1.  Reserved if the SU Beamformer subfield is 0 or the Supported Channel Width Set field does not indicate support for bandwidth of 320 MHz. |
| Ng = 16 SU Feedback | Indicates EHT beamformee support for a subcarrier grouping of 16 in the EHT Compressed Beamforming Report field for SU feedback. | Set to 0 if not supported.  Set to 1 if supported. |
| Ng = 16 MU Feedback | Indicates EHT beamformee support for a subcarrier grouping of 16 in the EHT Compressed Beamforming Report field for MU feedback. | Set to 0 if not supported.  Set to 1 if supported. |
| Codebook Size (ϕ, ψ) = {4, 2} SU Feedback | Indicates EHT beamformee support for a codebook size (ϕ, ψ) = {4, 2} in the EHT Compressed Beamforming Report field for SU feedback. | Set to 0 if not supported. |
| Codebook Size (ϕ, ψ) = {7, 5} MU Feedback | Indicates EHT beamformee support for a codebook size (ϕ, ψ) = {7, 5} in the EHT Compressed Beamforming Report field for MU feedback. | Set to 0 if not supported.  Set to 1 if supported. |
| Triggered SU Beamforming Feedback | For an AP, indicates support for the reception of partial and full bandwidth SU feedback in an EHT TB sounding sequence.  For a non-AP STA, indicates support for the transmission of partial and full bandwidth SU feedback in an EHT TB sounding sequence. | Set to 0 if not supported.  Set to 1 if supported. |
| Triggered CQI Feedback | For an AP, indicates support for the reception of partial and full bandwidth CQI feedback in an EHT TB sounding sequence.  For a non-AP STA, indicates support for the transmission of partial and full bandwidth CQI feedback in an EHT TB sounding sequence. | Set to 0 if not supported.  Set to 1 if supported. |
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| Partial Bandwidth DL MU-MIMO | For a non-AP STA, indicates support for the reception of a DL MU-MIMO transmission on an RU/MRU in an EHT MU PPDU where the RU/MRU does not span the entire PPDU bandwidth (DL MU-MIMO within OFDMA). | For a non-AP STA:  Set to 0 if not supported.  Set to 1 if supported.  NOTE—A non-AP STA that sets this field to 0 supports receiving a partial bandwidth RU/MRU allocated to a single user within an EHT MU PPDU where some other RU/MRU is employing DL MU-MIMO.  Reserved for an AP. |
| PPE Thresholds Present | Indicates whether or not the PPE Thresholds field is present. | Set to 1 if PPE Thresholds field is present.  Set to 0, otherwise |
| PSR-based SR Support | Indicates support for PSR-based SR operation. | Set to 0 if not supported.  Set to 1 if supported. |
| Power Boost Factor Support | Indicates that the STA supports a power boost factor for the RUs in an EHT MU PPDU in the range [0.5, 2]. | Set to 0 if not supported.  Set to 1 if supported. |
| EHT MU PPDU With 4x EHTLTF And 0.8 µs GI | Indicates support for the reception of an EHT MU PPDU with 4x EHTLTF and 0.8 µs guard interval duration. | Set to 0 if not supported.  Set to 1 if supported. |
| Max Nc | Indicates the maximum supported *Nc* for an EHT compressed beamforming/CQI report. | If the SU Beamformee subfield is 1:  Set to the maximum supported *Nc* for an EHT compressed beamforming/CQI report minus 1.  Reserved if the SU Beamformee subfield is 0. |
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| Non-Triggered CQI Feedback | For an AP, indicates support for the reception of full bandwidth non-triggered CQI feedback.  For a non-AP STA, indicates support for the transmission of full bandwidth non-triggered CQI feedback. | Set to 0 if not supported.  Set to 1 if supported. |
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| Nominal Packet Padding | Indicates the nominal packet padding to be used for all constellations, *NSS* and RU/MRU allocations the STA supports if the PPE Thresholds Present subfield is set to 0. | Set to 0 if the nominal packet padding is 0 µs for all constellations, *NSS* and RU/MRU allocations the STA supports.  Set to 1 if the nominal packet padding is 8 µs for all constellations, *NSS* and RU/MRU allocations the STA supports.  Set to 2 if the nominal packet padding is 16 µs for all constellations, *NSS* and RU/MRU allocations the STA supports.(#24396)  Set to 3 if the nominal packet padding is 16 μs for all modes with constellation ≤ 1024, ≤ 8 and RU/MRU ≤ 2×996, and 20 µs for all other modes the STA supports  Reserved if the PPE Thresholds Present subfield is 1. |
|  |  |  |
| Maximum number of supported EHT-LTFs | B0 indicates support of extra EHT-LTFs for non-OFDMA transmissions to a single user  B1-B2 indicates the maximum number of EHT-LTFs supported for non-OFDMA transmissions to single user  B3-B4 indicates the maximum number of EHT-LTFs supported for transmissions to multiple users and for an EHT NDP | B0 is set to 0 if not supported.  B0 is set to 1 if supported.  A B1-B2 value of 0 indicates a maximum of 4 EHT-LTFs  A B1-B2 value of 1 indicates a maximum of 8 EHT-LTFs  A B1-B2 value of 2 indicates a maximum of 12 EHT-LTFs  A B1-B2 value of 3 indicates a maximum of 16 EHT-LTFs  A B3-B4 value of 0 indicates a maximum of 4 EHT-LTFs  A B3-B4 value of 1 indicates a maximum of 8 EHT-LTFs  A B3-B4 value of 2 indicates a maximum of 12 EHT-LTFs  A B3-B4 value of 3 indicates a maximum of 16 EHT-LTFs  The maximum number of supported EHT-LTFs shall be no less than the number of supported spatial streams. |
| Support of BPSK-DCM | Indicates support for BPSK-DCM (MCS15) in 52+26-tone and 106+26-tone MRU, and 484+242-tone MRU if 80 MHz supported, and 996+484-tone MRU and 996+484+242-tone MRU if 160 MHz supported, and 3x996 MRU if 320 MHz supported. | Set to 0 if not supported.  Set to 1 if supported |
| Support of EHT-DUP in 6 GHz | Indicates support for EHT-DUP in 6 GHz | Set to 0 if not supported.  Set to 1 if supported  Set to 0 if 6 GHz not supported |
| Support for 20 MHz operating STA receiving NDP with wider Bandwidth | Indicates support of a 20 MHz-operating STA receiving an NDP with a PPDU bandwidth of 40, 80 or 160 MHz | Set to 0 if not supported.  Set to 1 if supported |

9.4.2.XXX.X Supported EHT-MCS And NSS Set field

The Supported EHT-MCS And NSS Set field indicates the combinations of EHT-MCSs and spatial streams that a STA supports for reception and the combinations that it supports for transmission. The format of the field is shown in Figure 9-F2 (Supported EHT-MCS And NSS Set field format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  | Rx EHT-MCS Map ≤ 80 MHz | Tx EHT-MCS Map ≤ 80 MHz | Rx EHT-MCS Map 160 MHz | Tx EHT-MCS Map 160 MHz | Rx EHT-MCS Map 320 MHz | Tx EHT-MCS Map 320 EHT MHz |
| Octets: | 2 | 2 | 0 or 2 | 0 or 2 | 0 or 2 | 0 or 2 |
| Figure 9-F2 Supported EHT-MCS And NSS Set field format | | | | | | |

The subfields of the Supported EHT-MCS And NSS Set field, and their presence, are defined in Table 9-T2 (Subfields of the Supported EHT-MCS And NSS Set field).

|  |  |  |
| --- | --- | --- |
| Table 9-T2 Subfields of the Supported EHT-MCS And NSS Set field | | |
| Subfield | Definition | Encoding |
| Rx EHT-MCS Map ≤ 80 MHz | If the operating channel width of the STA is greater than 80 MHz, indicates the maximum value of the RXVECTOR parameter MCS of a PPDU that can be received by the STA for a PPDU with bandwidth less than or equal to 80 MHz for each number of spatial streams.  If the operating channel width of this STA is less than or equal to 80 MHz, indicates the maximum value of the RXVECTOR parameter MCS for a PPDU that can be received by the STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 9-F2 (Supported EHT-MCS And NSS Set field format) and the associated description.(#24302) |
| Tx EHT-MCS Map ≤ 80 MHz | If the operating channel width of this STA is greater than 80 MHz, indicates the maximum value of the TXVECTOR parameter MCS of a PPDU that can be transmitted by the STA for a PPDU with bandwidth less than or equal to 80 MHz for each number of spatial streams.  If the operating channel width of this STA is less than or equal to 80 MHz, indicates the maximum value of the TXVECTOR parameter MCS for a PPDU that can be transmitted by the STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 9-F2 (Supported EHT-MCS And NSS Set field format) and the associated description.(#24302) |
| Rx EHT-MCS Map 160 MHz | If the operating channel width of the STA is 160 MHz, indicates the maximum value of the RXVECTOR parameter MCS for a 160 MHz PPDU that can be received by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 9-F2 (Supported EHT-MCS And NSS Set field format) and the associated description.  The Rx EHT-MCS Map 160 MHz subfield is present if B2 of the Supported Channel Width Set subfield of the EHT PHY Capabilities Information field is 1; otherwise, it is not present. |
| Tx EHT-MCS Map 160 MHz | If the operating channel width of the STA is 160 MHz, indicates the maximum value of the TXVECTOR parameter MCS for a 160 MHz PPDU that can be transmitted by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 9-F2 (Supported EHT-MCS And NSS Set field format) and the associated description.  The Tx EHT-MCS Map 160 MHz subfield is present if B2 of the Supported Channel Width Set subfield of the HE PHY Capabilities Information field is 1; otherwise, it is not present. |
| Rx EHT-MCS Map 320 MHz | If the operating channel width of the STA is 320 MHz, indicates the maximum value of the RXVECTOR parameter MCS for an 320 MHz PPDU that can be received by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 9-F2 (Supported EHT-MCS And NSS Set field format) and the associated description.  The Rx EHT-MCS Map 320 MHz subfield is present if B3 of the Supported Channel Width Set subfield of the HE PHY Capabilities Information field is 1; otherwise, it is not present. |
| Tx EHT-MCS Map 320 MHz | If the operating channel width of the STA is 160 MHz, indicates the maximum value of the TXVECTOR parameter MCS for an 320 MHz PPDU that can be transmitted by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 9-F2 (Supported EHT-MCS And NSS Set field format) and the associated description.  The Tx EHT-MCS Map EHT MHz subfield is present if B3 of the Supported Channel Width Set subfield of the HE PHY Capabilities Information field is 1; otherwise, it is not present. |

The Rx EHT-MCS Map and Tx EHT-MCS Map subfields have the format shown in Figure 9-F3 (Rx EHT-MCS Map subfield, Tx EHT-MCS Map subfield and Basic EHT-MCS And NSS Set field format).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0        B1 | B2         B3 | B4         B5 | B6         B7 | B8         B9 | B10     B11 | B12     B13 | B14     B15 |
|  | Max EHT-MCS For 1 SS | Max EHT-MCS For 2 SS | Max EHT-MCS For 3 SS | Max EHT-MCS For 4 SS | Max EHT-MCS For 5 SS | Max EHT-MCS For 6 SS | Max EHT-MCS For 7 SS | Max EHT-MCS For 8 SS |
| Bits: | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Figure 9-F3 Rx EHT-MCS Map subfield, Tx EHT-MCS Map subfield and Basic EHT-MCS And NSS Set field format | | | | | | | | |

The Max EHT-MCS For *n* SS subfield (where *n* = 1, …, 8) is encoded as follows:

* 0 indicates support for EHT-MCS 0-7 for *n* spatial streams, and EHT-MCS 15 for 1 spatial stream
* 1 indicates support for EHT-MCS 0-9 for *n* spatial streams, and EHT-MCS 15 for 1 spatial stream
* 2 indicates support for EHT-MCS 0-11 for *n* spatial streams, and EHT-MCS 15 for 1 spatial stream
* 3 indicates support for EHT-MCS 0-13 for *n* spatial streams, and EHT-MCS 15 for 1 spatial streamThe maximum receive *NSS*(#24396) for a given EHT-MCS is equal to the smaller of:
* The maximum value of *n* for which the Max EHT-MCS For *n* SS has a value that indicates support for that EHT-MCS
* The maximum supported *NSS*(#24396) as indicated by the value of the Rx NSS field of the Operating Mode Notification frame if the value of Rx NSS Type is 0 or of the OM Control subfield

NOTE—An EHT-MCS indicated as supported in the Rx EHT-MCS Map fields for a particular number of spatial streams might not be valid at all bandwidths (see 36.XXX(Parameters for EHT-MCSs)) and might be affected by 36.XXX (Additional rate selection constraints for EHT PPDUs).

The maximum transmit *NSS*(#24396) for a given EHT-MCS is equal to the smaller of:

* The maximum value of *n* for which the Max EHT-MCS For *n* SS has a value that indicates support for that EHT-MCS (0, 1, 2 or 3 for EHT-MCS 0-7 and 15, 1,2 or 3 for EHT-MCS 8-9 and 15, 2 or 3 for EHT-MCS 10-11 and 15, 3 for EHT-MCS 12-13, and 15)
* The maximum supported NSTS as indicated by the value of the Tx NSTS field of the OM Control subfield sent by a non-AP STA

When the maximum transmit for a given EHT-MCS is less than or equal to 8, then the maximum transmit for a given HE-MCS in supported HE-MCS and NSS Set field (9.4.4.248.4) shall be equal to the of the maximum transmit for that given EHT-MCS. When the maximum transmit for a given EHT-MCS is greater than 8, then the maximum transmit for a given HE-MCS in supported HE-MCS and NSS Set field (9.4.4.248.4) shall be equal to 8.

NOTE—An EHT-MCS indicated as supported in the Tx EHT-MCS Map fields for a particular number of space-time streams might not be valid at all bandwidths (see 36.5 (Parameters for EHT-MCSs)) and might be affected by 36.15.4.3 (Additional rate selection constraints for EHT PPDUs).