### IEEE P802.11 Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 11be D1.0 CR for EHT OM | | | | |
| Date: 2021-07-20 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Po-Kai Huang | Intel Corporation | 2200 Mission College Blvd, Santa Clara, CA 950542200 |  | po-kai.huang@intel.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for the following CIDs:

4090, 7087, 4137, 5505, 5782, 5536, 6082, 4870, 5732, 7678, 6662, 4138, 7551, 7552, 5893, 6150, 7936, 4927, 6002, 4162, 8064, 4339, 5731, 4928, 5113, 6750, 6974, 7021, 4163, 7937, 5503, 7085, 7086, 6573, 6574, 6576, 5615, 7679

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revision based on discussion offline.
* Rev 2: Revision based on discussion offline.
* Rev 3: Further editorial revision

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 TGbe D1.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe D1.0 Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 4090 | Abhishek Patil | 35.7.1 | 299.14 | The condition when the OM Control Support subfield is set to 0 missing | Add the "otherwise" condition | Revised –  Agree in principle with the commenter. We tie the setting back to dot11OMIOptionImplemented, so the OM control Support subfield can directly be covered by baseline 11ax text.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4090. |
| 7087 | Sigurd Schelstraete | 35.7.1 | 299.14 | "An EHT STA with dot11EHTOMIOptionImplemented equals to true shall set the OM Control Support subfield in the HE MAC Capabilities Information field in the HE Capabilities element it transmits to 1.". This could be in contradiction with 26.9 "An HE STA with dot11OMIOptionImplemented equal to true shall set the OM Control Support subfield in the HE MAC Capabilities Information field in the HE Capabilities element it transmits to 1; otherwise, the HE STA shall set the OM Control Support subfield to 0.". If dot11OMIOptionImplemented is false and dot11EHTOMIOptionImplemented is true, there is a contradiction. Should there be a requirement that dot11OMIOptionImplemented should be true if dot11EHTOMIOptionImplemented is true? | Clarify | Revised –  Agree in principle with the commenter. We tie the setting back to dot11OMIOptionImplemented, so the OM control Support subfield can directly be covered by baseline 11ax text.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4090. |
| 4137 | Alfred Asterjadhi | 9.2.4.6.8a | 72.57 | Remove primary. These are operaitng channel widths. | As in comment. | Revised –  We note that in 11ax, the indication has primary in the description. The intention is probably that the originator will operate in the primary indicated channel width unless SST, which is a R3 topic for now for 11be.  We only remove “primary” for “primary 320 MHz”.  *The Channel Width subfield indicates the operating channel width supported by the STA for both reception and transmission. It is set to 0 for 20 MHz, 1 for primary 40 MHz, 2 for primary 80 MHz, and 3 for 160 MHz and 80+80 MHz. The value 0 indicates a primary 20 MHz, unless the STA is an HE SST STA in which case it indicates any of the negotiated 20 MHz subchannels of the SST operation (see 26.8.7 (HE subchannel selective transmission)).*  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4137. |
| 5505 | Jinsoo Choi | 9.2.4.6a.8 | 72.63 | Unlike other indications of operating channel width of primary 20/40/80/160 MHz where the STA is not operating with SST, there is no primary 320 MHz defined and it should be just 320 MHz. | Modify Primary 320 MHz to 320 MHz | Revised –  Agree in principle with the commeter.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4137. |
| 5782 | Lei Huang | 9.2.4.6a.8 | 72.63 | no primary 320 MHz is defined. | change "primary 320 MHz" to "320 MHz" | Revised –  Agree in principle with the commeter.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4137. |
| 6082 | Mahmoud Kamel | 9.2.4.6a.8 | 73.02 | The use of the term "space-time streams" is no longer correct | change "space-time streams" to "spatial streams" | Revised –  Similar to other places of PHY clauses, we simply add the following note.  “Note that the EHT PHY does not support STBC, the terms “space-time stream” and “spatial streams” are equivalent in EHT.”  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 6082. |
| 4870 | Dong Guk Lim | 9.2.4.6a.8 | 73.02 | Change space-time stream with spatial stream | As in comment | Revised –  Similar to other places of PHY clauses, we simply add the following note.  “Note that the EHT PHY does not support STBC, the terms “space-time stream” and “spatial streams” are equivalent in EHT.”  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 6082. |
| 5732 | Laurent Cariou | 9.2.4.6a.8 | 72.08 | Tx NSTS extension field. There is no STBC in EHT, so NSTS is always equal to NSS. | We could rename this field, but it would be weird as it's the extension of a field called NSTS. Maybe the best is to add a note saying that NSS is always equal to NSTS in EHT as we don't have STBC and that NSTS and NSS can both be used to represent the number of spatial streams. | Revised –  Similar to other places of PHY clauses, we simply add the following note.  “Note that the EHT PHY does not support STBC, the terms “space-time stream” and “spatial streams” are equivalent in EHT.”  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 6082. |
| 7678 | Xiaofei Wang | 9.2.4.6a.8 | 72.15 | the definitions for RX NSS Extension field seems to be identical for bandwidth greater than less than 80 MHz, there is no need to use two paragraph to describe it. | please consider to combine the two paragraphs and make the text concise. | Rejected -  We note that the first paragraph has the following addition  *“for PPDU bandwidths less than or equal to 80 MHz”*  For the second paragraph, If the operating channel width of the STA is less than or equal to 80 MHz, the indication will work for all PPDU bandwidth even when PPDU bandwidth is larger than 80 MHz in MU case. Hence, combining two paragraphs is difficult. |
| 6662 | Raja Banerjea | 9.2.4.6a.8 | 72.23 | The interpretation of the operating channel bandwidth is same for greater than 80MHz or less than or equal to 80MHz. No need to duplicate if not required | delete duplicate text from line 23-28 and modify text in line 15-23 as required. | Rejected -  We note that the first paragraph has the following addition  *“for PPDU bandwidths less than or equal to 80 MHz”*  For the second paragraph, If the operating channel width of the STA is less than or equal to 80 MHz, the indication will work for all PPDU bandwidth even when PPDU bandwidth is larger than 80 MHz in MU case. Hence, combining two paragraphs is difficult. |
| 4138 | Alfred Asterjadhi | 9.2.4.6.8a | 71.15 | I think a table is needed here to determine the RxNSSs for different bandwidths, with the presence and absence of the EHT OM variant (latter case is easy by referencing oM control). | As in comment. | Revised –  We assume that the commenter means page 72. We follow the description for channel width to add the table.  We also add the table for Tx NSTS.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4138. |
| 7551 | Tomoko Adachi | 9.2.4.6a.8 | 72.15 | "..., then the Rx NSS Extension subfield in the EHT OM Control subfield together with the Rx NSS subfield in the OM Control subfield indicate ...". The verb "indicate" hangs to the subject "the Rx NSS Extension subfield", so the third-person singular 's' should apply... | Change "indicate" to "indicates". | Accepted - |
| 7552 | Tomoko Adachi | 9.2.4.6a.8 | 72.23 | "...MHz, then the Rx NSS Extension subfield in the EHT OM Control subfield together with the Rx NSS subfield in the OM Control subfield indicate ...". The verb "indicate" hangs to the subject "the Rx NSS Extension subfield", so the third-person singular 's' should apply... | Change "indicate" to "indicates". | Accepted - |
| 5893 | Liangxiao Xin | 9.2.4.6a.8 | 72.16 | the sentence here is very difficult to read | change the word to "If the operating channel width of the STA is greater than 80 MHz, then the Rx NSS Extension subfield in the EHT OM Control subfield together with the Rx NSS subfield in the OM Control subfield is set to value N\_ss-1 to indicate the maximum number of spatial streams, N\_ss, that the STA supports in reception, where the Rx NSS Extension subfield provides the MSB of the N\_ss-1 and the Rx NSS subfield provides the three LSBs of the N\_ss-1, for PPDU bandwidths less than or equal to 80 MHz. If the operating channel width of the STA is less than or equal to 80 MHz, then the Rx NSS Extension subfield in the EHT OM Control subfield together with the Rx NSS subfield in the OM Control subfield is set to N\_ss-1 to indicate the maximum number of spatial streams, N\_ss, that the STA supports in reception, where the Rx NSS Extension subfield provides the MSB of the N\_ss-1 and the Rx NSS subfield provides the three LSBs of the N\_ss-1." | Revised –  The description follows 11ax style, but we follow the spirit of the suggestion to improve the text.  A table is also added to simplify the texts based on the revision for CID 4182.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 5893. |
| 6150 | Mengshi Hu | 9.2.4.6a.8 EHT OM Control | 3.73 | "TX NSTS subfield" in Line 3 should be "Tx NSTS subfield" (Line 1 in this page is Tx NSTS subfield). In addition, do we need to unify the use of Tx or TX? I see sometimes TX is used and sometimes Tx is used. | "TX NSTS subfield" should be "Tx NSTS subfield" | Revised –  We revise “TX” with “Tx”.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4138. |
| 7936 | Youhan Kim | 35.7.1 | 299.17 | EHT supports maximum 8 SS at this point. | Change  "An EHT AP that supports 320 MHz or a number of spatial streams that is greater than eight shall set"  to  "An EHT AP that supports 320 MHz channel width shall set" | Revised –  Agree in principle with the commenter. We apply the change and add description based on dot11EHTBaseLineFeaturesImplementedOnly.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 7936. |
| 4927 | Eldad Perahia | 9.2.4.6a.8 | 71.55 | "The Control Information subfield in an EHT OM Control subfield contains information related to the OM changes for bandwidth of 320 MHz, Tx NSTS larger than 8, and Rx NSS larger than 8..." What is the point of this? Many places in the draft it states that NSS/NSTS max is 8. | as in comment | Revised –  Agree in principle with the commenter. We revise and add description based on dot11EHTBaseLineFeaturesImplementedOnly.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 7936. |
| 6002 | Liwen Chu | 9.2.4.6a.8 | 71.56 | when one of BW, Tx Nss, Rx Nss is not supported by HE, EHT OM is needed for OM operation. Change to "......for at leaset one of bandwidth of 320 MHz, Tx NSTS larger than 8, and Rx NSS larger than 8...". | As in comment | Revised –  Agree in principle with the commenter. We revise and add description based on dot11EHTBaseLineFeaturesImplementedOnly.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 7936. |
| 4162 | Alfred Asterjadhi | 35.7.1 | 299.17 | I think this paragraph should be the first one since it specifies which STA is required to set the MIB to true, which then determines how to set the capability bit. So move it at the beginning. Also citing the AP here is ambiguous. Does it mean that a non-AP STA that supports those parameters is not required to implement reception of EHT OM COntrol subfield? I think if cap is set to 1 then you are reqiured to implement reception of this control field. | As in comment. | Revised –  Agree in principle with the commenter. Also, we reivse setting of dot11EHTOMIOptionImplemented and dot11OMIOptionImplemented as follows in CID 4090, so the later description is not needed anymore.  *An EHT STA with dot11EHTOMIOptionImplemented equals to true shall set dot11OMIOptionImplemented to true*  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 4162. |
| 8064 | Yuchen Guo | 9.2.4.6a.8 | 72.31 | "spatia" should be "spatial" | as in comment | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 4339 | Arik Klein | 9.2.4.6a.8 | 72.31 | Correct the typo in the following sentence: "If the operating channel width of the STA is greater than 80 MHz, then the maximum number of \*spatia\* streams that the STA supports.." | Should be spatial (and not spatia) | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 5731 | Laurent Cariou | 9.2.4.6a.8 | 72.31 | spatia should be spatial | editorial fix | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 4928 | Eldad Perahia | 9.2.4.6a.8 | 72.31 | "spatia" | as in comment | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 5113 | Geonjung Ko | 9.2.4.6a.8 | 72.31 | Typo "spatia" | Change "spatia" to "spatial". | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 6750 | Romain GUIGNARD | 9.2.4.6a.8 | 72.31 | typo: spatia instead of spatial | change spatia to spatial | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 6974 | Sanghyun Kim | 9.2.4.6a.8 | 72.31 | Typo 'spatia streams' | Change 'spatia streams' to 'spatial streams' | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 7021 | Sigurd Schelstraete | 9.2.4.6a.8 | 72.31 | Typo. Change "number of spatia streams" to "number of spatial streams" | See comment | Revised –  We do the editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 8064. |
| 4163 | Alfred Asterjadhi | 35.7.1 | 299.17 | I think the rules apply to both solicitation of an EHT TB PPDU by an EHT AP (oh also the solicitation of a non-TB PPDU as well, think of CTS frame) and the generation of an EHT TB PPDU by a non-AP STA. Please expand to cover these cases explicitly. | As in comment. | Rejected –  We assume that the commenter comments on sentence in 299.36. We note that non-TB case is already covered by the following sentence.  *An OMI initiator that transmits a frame including an EHT OM Control subfield and a OMI responder that receives a frame including an EHT OM Control field shall follow the rules defined in 26.9 (Operating mode indication), except that the , Nss, Nsts, and/or the maximum operating channel width shall be calculated by EHT OM Control subfield together with the OM Control subfield as defined in 9.2.4.6a.8 (EHT OM Control).*  Also, we note that soliciting EHT/HE TB PPDU is covered by the OMI responder rule and generating EHT/HE TB PPDU is covered by the OMI initiator rule in 26.9.3.  Hence, the following existing sentences cover what we need.  *For an EHT STA that is an OMI initiator or an OMI responder, the rule described in 26.9.3 (Transmit operating mode (TOM) indication) that applies to HE TB PPDU shall apply to EHT TB PPDU.* |
| 7937 | Youhan Kim | 35.7.1 | 299.37 | Rules that apply to HE TB PPDU shall "also" apply to EHT TB PPDU. | Change  "HE TB PPDU shall apply to EHT TB PPDU."  to  "HE TB PPDU shall also apply to EHT TB PPDU." | Accepted - |
| 5503 | Jinsoo Choi | 9.2.4.6.3a | 71.27 | Since the EHT operating mode (EHT OM) was defined by using one of Control ID subfield, wouldn't it be better to change the Operating mode (OM) with Control ID value of 1 to HE operting mode (HE OM) to avoid confusion? Also more new operating modes might be newly defined for post-EHTs in the future and all are operating modes. | As in comment | Rejected –  We note that we can not do format change for baseline, and a name change may imply format change, which will not be the intention.  Also, name change will require global change across every place in the baseline (100+ instances), which may not be necessary. |
| 7085 | Sigurd Schelstraete | 35.7.1 | 299.09 | Change "equals to" to "equal to" | See comment | Accepted - |
| 7086 | Sigurd Schelstraete | 35.7.1 | 299.14 | Change "equals to" to "equal to" | See comment | Accepted - |
| 6573 | Payam Torab Jahromi | 35.7.1 | 299.32 | Change "a OMI responder" to "an OMI responder" | As in the comment | Accepted - |
| 6574 | Payam Torab Jahromi | 35.7.1 | 299.42 | a/an replacement, missing "the", and a few edits to clarify. | Change the paragraph to "An OMI initiator that transmits a frame that includes an EHT OM Control subfield, and an OMI responder that receives a frame that includes an EHT OM Control field, shall follow the rules defined in 26.9 (Operating mode indication), except that the NSS, NSTS, and/or the maximum operating channel width shall be calculated by the combination of the EHT OM Control and the OM Control subfields, as defined in 9.2.4.6a.8 (EHT OM Control)." | Revised –  We change “together with” to “combined with”. We also do the “an” and “the” editorial fix.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 6574. |
| 6576 | Payam Torab Jahromi | 35.7.1 | 299.06 | No need for a General subclause if it is the only subclause under 35.7. | Remove the sublause title (35.7.1 General); all text remains under 35.7 (Operating mode indication) | Accepted - |
| 5615 | John Wullert | 35.7.1 | 299.09 | The section does not clearly define Operating mode indication. | Add a description of the intentions and functionality of Operating mode indication. | Rejected –  Basic OMI initiator and OMI responder definitions and other descriptions are inherited from 26.9. See the following notes.  *NOTE 1—An EHT STA is an HE STA and as such inherits all the functionalities defined in 26.9 (Operating mode indication).*  *NOTE 2—Based on the requirement to concatenate the OM Control subfield after an EHT OM Control subfield and the definition of OMI initiator and OMI responder in 26.9 (Operating mode indication), an EHT STA that transmits a frame including an EHT OM Control subfield is an OMI initiator, and an EHT STA with dot11EHTOMIOptionImplemented to true that receives a frame including an EHT OM Control subfield is an OMI responder.* |
| 7679 | Xiaofei Wang | 9.2.4.6a.8 | 72.30 | This paragraph does not specify format and should be removed from clause 9 | delete or move this paragraph to another clause | Rejected –  We note that the following senentece is added in 9.2.4.6a.2 OM Control in 11ax.  *If the operating channel width of the STA is greater than 80 MHz, then the maximum number of spatial streams that the STA supports in reception for PPDU bandwidths greater than 80 MHz is defined in 26.9 (Operating mode indication).* |
| 5536 | JINYOUNG CHUN | 9.2.4.6a.8 | 72.63 | Legacy STA only can read OM Control when AP send the EHT OM Control. Then they think the channel width is 20MHz. It's better that they think the channel width is 160MHz. So please change the value from 0 to 3 in Channel Width subfield in OM subfield to indicate Primary 320MHz. | Change the Table 9-24g as below: When Channel Width Extension subfield in EHT OM Control subfield is set to 1, Channel Width subfield in OM subfield is set to 3 to indicate Primary 320MHz. Values 0-2 of Channel Width subfield in OM subfield are reserved. | Revised –  OM can only be sent in individually addressed frame because an immediate acknowledgement is required, so there is no confusion for legacy STA because EHT OM will not be sent to legacy STA.  However, there is a clarification that is needed for VHT table to remove 80+80 and clarify the setting under EHT OM.  TGbe editor to make the changes shown in 11-21/1209r3 under all headings that include CID 5536. |

**Discussion:** *None.*

**Propose:**

***9.2.4.6 HT Control field***

***9.2.4.6.3a HE variant***

## Update [Table 9-22a (Control ID subfield values)](#bookmark0) as follows:

**Table 9-22a—Control ID subfield values**

|  |  |  |  |
| --- | --- | --- | --- |
| **Control ID value** | **Meaning** | **Length of the Control Information subfield (bits)** | **Content of the Control Information subfield** |
| 0 | Triggered response scheduling (TRS) | 26 | See 9.2.4.6a.1 (TRS Control) |
| 1 | Operating mode (OM) | 12 | See 9.2.4.6a.2 (OM Control) |
| 2 | HE link adaptation (HLA) | 26 | See 9.2.4.6a.3 (HLA Control) |
| 3 | Buffer status report (BSR) | 26 | See 9.2.4.6a.4 (BSR Control) |
| 4 | UL power headroom (UPH) | 8 | See 9.2.4.6a.5 (UPH Control) |
| 5 | Bandwidth query report (BQR) | 10 | See 9.2.4.6a.6 (BQR Control) |
| 6 | Command and status (CAS) | 8 | See 9.2.4.6a.7 (CAS Control) |
| 7 | EHT operating mode (EHT OM) | 6 | See [9.2.4.6a.8 (EHT OM Control)](#bookmark1) |
| 8 | Single response scheduling (SRS) | 10 | See [9.2.4.6a.9 (SRS Control)](#bookmark4) |
| 10 | AP assistance request (AAR) | 20 | See [9.2.4.6a.10 (AAR Control)](#bookmark6) |
| 9, 11–14  ~~7–14~~ | Reserved |  |  |
| 15 | Ones need expansion surely (ONES) | 26 | Set to all 1s |

***Insert the following new subclause after 9.2.4.6a.7 (CAS Control)***

***TGbe editor: change 9.2.4.6a.8 EHT OM Control (track change on):***

***9.2.4.6a Control subfield variants of an A-Control subfield***

***9.2.4.6a.8 EHT OM Control***

The Control Information subfield in an EHT OM Control subfield contains information related to the OM changes for bandwidth of 320 MHz, Tx NSTS larger than 8, and Rx NSS larger than 8 for the STA transmit ting the frame containing this information (see 35.8 (Operating mode indication)). The format of the subfield is shown in [Figure 9-22i (Control Information subfield format in an EHT OM Control subfield)](#bookmark2).

B0 B1 B2 B3 B5

|  |  |  |  |
| --- | --- | --- | --- |
| Rx NSS  Extension | Channel Width Extension | Tx NSTS  Extension | Reserved |

Bits: 1 1 1 3

**Figure 9-22i—Control Information subfield format in an EHT OM Control subfield**

If the operating channel width of the STA is greater than 80 MHz, then the Rx NSS Extension subfield in the EHT OM Control subfield combined(#6574) with the Rx NSS subfield in the OM Control subfield indicates(#7551) *NSS* – 1, where *NSS* is the maximum number of spatial streams that the STA supports in reception(#5893) (#4138)for PPDU bandwidths less than or equal to 80 MHz (#5893).

If the operating channel width of the STA is less than or equal to 80 MHz, then the Rx NSS Extension subfield in the EHT OM Control subfield combined(#6574) with the Rx NSS subfield in the OM Control subfield indicates(#7552) *NSS* – 1, where *NSS* is the maximum number of spatial streams (#5893)that the STA supports in reception(#4138)(#5893).

The encoding of the Rx NSS Extension subfield in EHT OM Control subfield combined with the Rx NSS subfield in OM Control subfield is described in Table XXX (The encoding of the Rx NSS  [Extension subfield in EHT OM Control subfield combined with the Rx NSS subfield in OM](#bookmark3) [subfield)](#bookmark3).(#4138)

**Table XXX - The encoding of the Rx NSS Extension subfield in EHT OM Control subfield** combined **with the Rx NSS subfield in OM subfield**(#4138)

|  |  |  |
| --- | --- | --- |
| **Rx NSS Extension subfield in EHT OM Control subfield** | **Rx NSS subfield in OM subfield** | **Indication of the** *NSS* |
| 0 | 0 | 1 |
| 0 | 1 | 2 |
| 0 | 2 | 3 |
| 0 | 3 | 4 |
| 0 | 4 | 5 |
| 0 | 5 | 6 |
| 0 | 6 | 7 |
| 0 | 7 | 8 |
| 1 | 0 | 9 |
| 1 | 1 | 10 |
| 1 | 2 | 11 |
| 1 | 3 | 12 |
| 1 | 4 | 13 |
| 1 | 5 | 14 |
| 1 | 6 | 15 |
| 1 | 7 | 16 |

An EHT STA with dot11EHTBaseLineFeaturesImplementedOnly equal to true does not set Rx NSS Extension subfield in EHT OM Control subfield to 1. (#7936)

If the operating channel width of the STA is greater than 80 MHz, then the maximum number of spatial streams that the STA supports in reception for non-EHT PPDU bandwidths greater than 80 MHz is defined in 26.9 (Operating mode indication).(#8064)

The Channel Width Extension subfield in EHT OM Control subfield combined(#6574) with the Channel Width sub- field in OM Control subfield indicates the operating channel width supported by the STA for both reception and transmission.

The encoding of the Channel Width Extension subfield in EHT OM Control subfield combined(#6574) with the Channel Width subfield in OM Control subfield is described in [Table 9-24g (The encoding of the Channel](#bookmark3) [Width Extension subfield in EHT OM Control subfield combined(#6574) with the Channel Width subfield in OM](#bookmark3) [subfield)](#bookmark3).

**Table 9-24g—The encoding of the Channel Width Extension subfield in EHT OM Control subfield** combined(#6574) **with the Channel Width subfield in OM subfield**

|  |  |  |
| --- | --- | --- |
| **Channel Width Extension subfield in EHT OM Control subfield** | **Channel Width subfield in OM subfield** | **Indication of the operating channel width** |
| 0 | 0 | Primary 20 MHz |
| 0 | 1 | Primary 40 MHz |
| 0 | 2 | Primary 80 MHz |
| 0 | 3 | Primary 160 MHz |
| 1 | 0 | 320 MHz(#4137) |
| 1 | 1–3 | Reserved |

The Tx NSTS Extension subfield in EHT OM Control subfield combined(#6574)with the Tx NSTS subfield in OM subfield indicates *NSTS* – 1, where *NSTS* is the maximum number of space-time streams (#5893)that the STA supports in transmission.(#4138)

The encoding of the Tx NSTS Extension subfield in EHT OM Control subfield combined with the Tx NSTS subfield in OM Control subfield is described in Table XXX (The encoding of the Tx NSTS  [Extension subfield in EHT OM Control subfield combined with the Tx NSTS subfield in OM](#bookmark3) [subfield)](#bookmark3). (#4138)

**Table XXX - The encoding of the Tx NSTS Extension subfield in EHT OM Control subfield combined with the Tx NSTS subfield in OM subfield**(#4138)

|  |  |  |
| --- | --- | --- |
| **Tx NSTS Extension subfield in EHT OM Control subfield** | **Tx NSTS subfield in OM subfield** | **Indication of the** *NSTS* |
| 0 | 0 | 1 |
| 0 | 1 | 2 |
| 0 | 2 | 3 |
| 0 | 3 | 4 |
| 0 | 4 | 5 |
| 0 | 5 | 6 |
| 0 | 6 | 7 |
| 0 | 7 | 8 |
| 1 | 0 | 9 |
| 1 | 1 | 10 |
| 1 | 2 | 11 |
| 1 | 3 | 12 |
| 1 | 4 | 13 |
| 1 | 5 | 14 |
| 1 | 6 | 15 |
| 1 | 7 | 16 |

An EHT STA with dot11EHTBaseLineFeaturesImplementedOnly equal to true does not set Tx NSTS Extension subfield in EHT OM Control subfield to 1. (#7936)

NOTE - EHT PHY does not support STBC, the terms “space-time stream” and “spatial streams” are equivalent in EHT.(#6082)

***TGbe editor: change 35.4 Operating mode indication (track change on):***

# Operating mode indication

(#6576)

An EHT AP that supports 320 MHz shall set dot11EHTOMIOptionImplemented to true.(#7936, #4162)

An EHT STA with dot11EHTOMIOptionImplemented equal(#7085) to true shall set the EHT OM Control Support subfield in the EHT MAC Capabilities Information field in the EHT Capabilities element it transmits to 1; otherwise the EHT STA shall set the EHT OM Control Support subfield to 0.

An EHT STA with dot11EHTOMIOptionImplemented equal(#7086) to true shall set dot11OMIOptionImplemented to true.(#4090)

(#4162)

An EHT STA that transmits a frame with an A-Control subfield of HE variant HT Control field, which includes an EHT OM Control subfield shall concatenate the OM Control subfield within the same A-Control subfield after the EHT OM Control field. An EHT STA shall not include an EHT OM Control field in an A- Control field unless the OM Control field is present in the same A-Control field.

NOTE 1—An EHT STA is an HE STA and as such inherits all the functionalities defined in 26.9 (Operating mode indication).

NOTE 2—Based on the requirement to concatenate the OM Control subfield after an EHT OM Control subfield and the definition of OMI initiator and OMI responder in 26.9 (Operating mode indication), an EHT STA that transmits a frame including an EHT OM Control subfield is an OMI initiator, and an EHT STA with dot11EHTOMIOptionImplemented to true that receives a frame including an EHT OM Control subfield is an OMI responder.

For an EHT STA that is an OMI initiator or an OMI responder, the rule described in 26.9.3 (Transmit operating mode (TOM) indication) that applies to HE TB PPDU shall also apply to EHT TB PPDU.(#7937)

An OMI initiator that transmits a frame including an EHT OM Control subfield and an(#6573) OMI responder that receives a frame including an EHT OM Control field shall follow the rules defined in 26.9 (Operating mode indication), except that Table 26-9 is replaced with Table 35-x (Setting of VHT Channel Width and VHT NSS at an EHT STA transmitting the EHT OM Control subfield combined with the OM Control subfield), and(#5536) the *NSS ,* the(#6574) *NSTS* , and/or the maximum operating channel width shall be calculated by the(#6574) EHT OM Control subfield combined(#6574) with the OM Control subfield as defined in 9.2.4.6a.8 (EHT OM Control).

NOTE - EHT PHY does not support STBC, the terms “space-time stream” and “spatial streams” are equivalent in EHT.(#6082)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Table 35-x - Setting of VHT Channel Width and VHT NSS at an EHT STA transmitting the EHT OM Control subfield combined with the OM Control subfield (#5536) | | | | | | | |
| EHT OM Control Subfield | OM Control subfield | VHT capabilities of STA transmitting  the EHT OM Control subfield combined with the OM Control subfield | | VHT NSS support of STA transmitting the EHT OM Control subfield combined with the OM Control subfield as a function of the PPDU bandwidth (× Max VHT NSS) (see requirements R1 and R2  at end of this table) | | | | Location of 160 MHz center frequency if BSS bandwidth is 160 MHz |
| Channel Width Extension | Channel Width | Supported Channel Width | Extended NSS BW Support | 20 MHz | 40 MHz | 80 MHz | 160 MHz |
| 0 | 0 | 0–2 | 0–3 | 1 |  |  |  |  |
| 0 | 1 | 0–2 | 0–3 | 1 | 1 |  |  |  |
| 0 | 2 | 0–2 | 0–3 | 1 | 1 | 1 |  |  |
| 0 | 3 | 0 | 1 | 1 | 1 | 1 | 1/2 | CCFS2 |
| 0 | 3 | 0 | 2 | 1 | 1 | 1 | 1/2 | CCFS2 |
| 0 | 3 | 0 | 3 | 1 | 1 | 1 | 3/4 | CCFS2 |
| 0 | 3 | 1 | 0 | 1 | 1 | 1 | 1 | CCFS1 |
| 0 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | CCFS1 |
| 0 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | CCFS1 |
| 0 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | CCFS1 |
| 0 | 3 | 2 | 0 | 1 | 1 | 1 | 1 | CCFS1 |
| 0 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | CCFS1 |
| 1 | N/A | 0 | 1 | 1 | 1 | 1 | 1/2 | CCFS2 |
| 1 | N/A | 0 | 2 | 1 | 1 | 1 | 1/2 | CCFS2 |
| 1 | N/A | 0 | 3 | 1 | 1 | 1 | 3/4 | CCFS2 |
| 1 | N/A | 1 | 0 | 1 | 1 | 1 | 1 | CCFS1 |
| 1 | N/A | 1 | 1 | 1 | 1 | 1 | 1 | CCFS1 |
| 1 | N/A | 1 | 2 | 1 | 1 | 1 | 1 | CCFS1 |
| 1 | N/A | 1 | 3 | 2 | 2 | 2 | 2 | CCFS1 |
| 1 | N/A | 2 | 0 | 1 | 1 | 1 | 1 | CCFS1 |
| 1 | N/A | 2 | 3 | 2 | 2 | 2 | 1 | CCFS1 |
| R1: NSS support shall be rounded down to the nearest integer.  R2: The maximum NSS support shall be 8 if dot11EHTBaseLineFeaturesImplementedOnly is equal to true.  NOTE 1—Max VHT NSS as indicated by the Rx NSS Extension subfield in EHT OM Control subfield combined with the Rx NSS subfield in OM Control subfield. The Rx NSS Extension subfield in EHT OM Control subfield combined with the Rx NSS subfield in OM Control subfield indicates the same Max HE NSS and Max VHT NSS. Max VHT NSS is at the bandwidth indicated in the VHT Capabilities element. For all allowed MCS values, the Max VHT NSS values are same, but the supported NSS can be different.  NOTE 2—1/2 × or 3/4 × Max VHT NSS support might end up being 0, indicating no support.  NOTE 3—Any other combination than the ones listed in this table is reserved.  NOTE 4—CCFS1 refers to the value of the Channel Center Frequency Segment 1 field of the most recently transmitted VHT Operation element (if any) or HE Operation element.  NOTE 5—CCFS2 refers to the value of the Channel Center Frequency Segment 2 field of the most recently transmitted HT Operation element.  NOTE 6—CCFS1 is nonzero when the current BSS bandwidth is 160 MHz and the NSS support is at least Max VHT NSS. CCFS2 is zero in this case.  NOTE 7—CCFS2 is nonzero when the current BSS bandwidth is 160 MHz and the NSS support is less than Max VHT NSS. CCFS1 is zero in this case.  NOTE 8—At most one of CCFS1 and CCFS2 is nonzero.  NOTE 9—A supported multiple of Max VHT NSS applies to both transmit and receive. A supported multiple of Max HE NSS applies to receive.  NOTE 10—Some combinations of Supported Channel Width Set and Extended NSS BW support might not occur in practice. | | | | | | | | |

***TGbe editor: change the following paragraph in 9.4.2.157.3 Supported VHT-MCS and NSS Set field (track change on):***

**9.4.2.157.3 Supported VHT-MCS and NSS Set field**

***Insert the following at the end of this subclause:***

The value of Max VHT NSS for a given MCS is equal to the smaller of:  
— the maximum value of *n* for which the Max VHT-MCS for *n* SS has a value that indicates support for  
that MCS  
— the maximum supported *NSS* as indicated in by the value of the Rx NSS field of the OM Control subfield (and further defined in the Table 26-9 (Setting of the VHT Channel Width and VHT NSS at an HE STA transmitting the OM Control subfield) and Table 35-x (Setting of VHT Channel Width and VHT NSS at an EHT STA transmitting the EHT OM Control subfield combined with the OM Control subfield) (#5536))

NOTE—A VHT-MCS indicated as supported in the VHT-MCS Map fields for a particular number of spatial streams  
might not be valid at all bandwidths (see 21.5 (Parameters for VHT-MCSs)), might be limited by the declaration of Tx  
Highest Supported Long GI Data Rates and Rx Highest Supported Long GI Data Rates, and might be affected by  
10.6.13.3 (Additional rate selection constraints for VHT PPDUs) and the value of the Extended NSS BW Support field  
of the VHT Capabilities Information field in 9.4.2.157.2 (VHT Capabilities Information field) and the 160/80+80 BW  
subfield of the Operating Mode field in 9.4.1.53 (Operating Mode field).

***TGbe editor: change the following two paragarphs 9.4.2.248.4 Supported HE-MCS And NSS Set field (track change on):***

**9.4.2.248.4 Supported HE-MCS And NSS Set field**

The maximum receive *NSS* for a given HE-MCS is equal to the smaller of

* The maximum value of *n* for which the Max HE-MCS For *n* SS has a value that indicates support for that HE-MCS or
* The maximum supported *NSS* 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 or by the EHT OM Control subfield combined with the OM Control subfield(#5536).

NOTE 1—An HE-MCS indicated as supported in the Rx HE-MCS Map fields for a particular number of spatial streams might not be valid at all bandwidths (see 27.5 (Parameters for HE-MCSs)) and might be affected by 26.15.4.3 (Additional rate selection constraints for HE PPDUs).

The maximum transmit *NSS* for a given HE-MCS is equal to the smaller of

* The maximum value of *n* for which the Max HE-MCS For *n* SS has a value that indicates support for that HE-MCS (0, 1, or 2 for HE-MCS 0-7, 1 or 2 for HE-MCS 8-9, 2 for HE-MCS 10-11) or
* 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 or by the EHT OM Control subfield combined with the OM Control subfield sent by a non-AP STA(#5536).

NOTE 2—An HE-MCS indicated as supported in the Tx HE-MCS Map fields for a particular number of space-time streams might not be valid at all bandwidths (see 27.5 (Parameters for HE-MCSs)) and might be affected by 26.15.4.3 (Additional rate selection constraints for HE PPDUs).