IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB266 CR on EHT Operation element | | | | |
| Date: 2022.07.29 | | | | |
| Author(s): | | | | |
| Name | Company | Address | Phone | email |
| Guogang Huang | Huawei Technologies | F3-6-A124, Huawei Base, Bantian, Longgang, Shenzhen, Guangdong, China, 518129 |  | [huangguogang1@huawei.com](mailto:huangguogang1@huawei.com) |
| Yuchen Guo |  |  |  |
| Yunbo Li |  |  |  |
| Yousi Lin |  |  |  |
| Ming Gan |  |  |  |

Abstract

This submission contains proposed comment resolutions to comments on P802.11be D2.0. The following 29 CIDs are resolved:

10807 10808 10990 10991 11026 11037 11043 11044 11045 11046 11512 11513 11514 11857 11858 11859 11860 11861 11862 12056 12131 12824 12969 12970 13363 13364 13382 13467 13468

Revisions:

- Rev 0: Initial version of the document.

- Rev 1: Updated based on offline discussion

- Rev 2: Updated resolution for CID 11859 and 10991

- Rev 3: Updated resolution for CID 10990 based on offline discussion

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page.**  **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 10807 | Dong Guk Lim | 9.4.2.311 | 209.38 | To clarify it, change the reference. | Change "Figure 9-1002a (EHT Operation element for mat)" with " Figure 9-1002ai and Figure 9-1002aj" | Revised  Agree in principle. The correct reference is provided.  TGbe editor, please apply the changes with the CID tag (#10807) in 11/22-1267r4 |
| 11512 | Xiaofei Wang | 9.4.2.311 | 209.38 | The basic EHT-MCS and NSS set field is not defined in figure 9-1002a. Please provide a correct reference. | as in comment | Revised  Agree in principle. The correct reference is provided.  TGbe editor, please apply the changes with the CID tag (#10807) in 11/22-1267r4 |
| 11857 | Alfred Asterjadhi | 9.4.2.311 | 209.36 | Wrong reference. Replace with the correct subclause for where basic EHT MCS and NSS Set are defined. | As in comment. | Revised  Agree in principle. The correct reference is provided.  TGbe editor, please apply the changes with the CID tag (#10807) in 11/22-1267r4 |
| 12824 | Laurent Cariou | 9.4.2.311 | 209.38 | The Basic EHT-MCS And NSS Set field is defined in Figure 9-1002a (EHT Operation element format). The reference is not correct: should be 9-1002ai. | as in comment | Revised  Agree in principle. The correct reference is provided.  TGbe editor, please apply the changes with the CID tag (#10807) in 11/22-1267r4 |
| 10808 | Dong Guk Lim | 9.4.2.311 | 209.43 | EHT Operation Information Present field is used to indicate whether the EHT Operation Information exists or not in the EHT Operation element. and, to confirm the difference in channel bandwidth information as described in text from L43 to L46, there needs to include an EHT Operation Information. it means that the EHT Operation Information is included in the EHT Operation element and the EHT Operation Information Present field is set to 1. so, it is a little strange that EHT Operation Information Present field should be set to 1 after checking of difference of CH BW. To clarify it, delete this text or modify it. | As in the comment. | Revised  Agree in principle. The normative behavior is placed in subclause 35.16.1 (Basic EHT BSS operation).  TGbe editor, please apply the changes with the CID tag (#10808) in 11/22-1267r4 |
| 11859 | Alfred Asterjadhi | 9.4.2.311 | 209.50 | I think the rule here needs to refer to the dependency of setting this bit to one when the EHT Op Info present is one, rather than validity of the field. So I suggest to simply say this bit is set to 1 only if Eht Op Info Present is 1 or smth like that. | As in comment. | Revised  Agree in principle. This sentence is revised  TGbe editor, please apply the changes with the CID tag (#11859) in 11/22-1267r4 |
| 10991 | Yanjun Sun | 9.4.2.311 | 209.50 | "HT Operation Information Present" needs to be changed to "EHT Operation Information Present " | As in comment | Revised  Agree in principle. This bug is fixed..  TGbe editor, please apply the changes with the CID tag (#10991) in 11/22-1267r4 |
| 11043 | Po-Kai Huang | 9.4.2.311 | 209.50 | For the sentence, "The Disabled Subchannel Bitmap Present subfield is valid only when the HT Operation Information Present subfield is set to 1.", it shuold be "EHT Operation Information Present subfield is set to 1". I consider that this is an obvious typo. | change "The Disabled Subchannel Bitmap Present subfield is valid only when the HT Operation Information Present subfield is set to 1." to "The Disabled Subchannel Bitmap Present subfield is valid only when the EHT Operation Information Present subfield is set to 1." | Revised  Agree in principle. This bug is fixed..  TGbe editor, please apply the changes with the CID tag (#10991) in 11/22-1267r4 |
| 11514 | Xiaofei Wang | 9.4.2.311 | 209.50 | where is "HT Operation Information present subfield" defined and included? | as in comment | Revised  Agree in principle. This bug is fixed..  TGbe editor, please apply the changes with the CID tag (#10991) in 11/22-1267r4 |
| 13363 | Liwen Chu | 9.4.2.311 | 209.49 | change "only when the HT Operation Information Present subfield is set to 1" to "only when the EHT Operation Information Present subfield is set to 1" | As in comment | Revised  Agree in principle. This bug is fixed..  TGbe editor, please apply the changes with the CID tag (#10991) in 11/22-1267r4 |
| 11026 | Hanqing Lou | 9.4.2.311 | 209.43 | "The EHT Operation Information Present subfield is set to 1 if the channel width indicated in an HT Operation, VHT Operation, or HE Operation element that is present in the same Manage ment frame is different from the Channel Width field indicated in the EHT Operation Information field". The Disabled Subchannel Bitmap subfield is in the EHT Operation Information field. If the channel width is the same as VHT Operation Element, but Disabled subchannel Bitmap is updated, will the EHT Operation Information Present subfield be set to 1? | When Disabled Subchannel Bitmap Present subfield is 1, the EHT Operation Information Present subfield shall be 1. | Rejected  Since the pre-EHT STA doesn’t support static channel puncturing, the mentioned case will not happened, i.e. the channel width is the same as the VHT Operation Element, but the Disabled subchannel Bitmap is updated. |
| 11037 | Po-Kai Huang | 9.4.2.311 | 212.04 | Table 9-401b is not needed. EHT BSS channel width is determined solely by the indication in the Channel Width field and CCFS0 and CCFS1 setting is also based on the Channel Width subfield. The Table creates confusion because it may suggest EHT BSS channel width depends jointly by Channel Width subfield, CCFS0 subfield and CCFS1 subfield. Suggest to delete Table 9-401b because Table 9-401a is enough. | Delete Table 9-401b. | Accepted  1267r4 |
| 11044 | Po-Kai Huang | 9.4.2.311 | 209.43 | For the sentence, "The EHT Operation Information Present subfield is set to 1 if the channel width indicated in an HT Operation, VHT Operation, or HE Operation element that is present in the same Management frame is different from the Channel Width field indicated in the EHT Operation Information field." It is probably better to clarify that the channel width indication is indicated jointly by HT Operation, VHT Operation, or HE Operation if they are present. Hence, the sentence is not interpreted literally by just looking one of the indication. | Change the sentence to "The EHT Operation Information Present subfield is set to 1 if the channel width indicated jointly by an HT Operation element (if present), VHT Operation element (if present), or HE Operation element (if indicaiton for channel width present) in the same Management frame is different from the Channel Width field indicated in the EHT Operation Information field." | Revised  Agree in principle. This sentence is revised.  TGbe editor, please apply the changes with the CID tag (#11044) in 11/22-1267r4 |
| 12969 | Chunyu Hu | 9.4.2.311 | 209.43 | Improve readability: "set to 1 if the channel width indicated in ..." and also fixed the inconsistency in "channel width" and "Channel Width" ==> "set to 1 if the channel Width indicated in the EHT Operation Information field is different from that indicated in an HT Operation, VHT Operation ..." | As in comment | Revised  Agree in principle. This sentence is revised.  TGbe editor, please apply the changes with the CID tag (#11044) in 11/22-1267r4 |
| 13468 | Liwen Chu | 9.4.2.311 | 209.43 | Change the text to "The EHT Operation Information Present subfield is set to 1 if the allowed maximal channel width of VHT/HE PPDU indicated in VHT Operation, or HE Operation element is different from the allowed maximal channel width of EHT PPDU in the BSS." | As in comment | Revised  Agree in principle. This sentence is revised.  TGbe editor, please apply the changes with the CID tag (#11044) in 11/22-1267r4 |
| 13382 | Liwen Chu | 9.4.2.311 | 209.43 | Per the text, the EHT Operation Information Present will be set to 1 in 5GHz band when the BSS operating channel is more than 40 MHz. This should not be what people want. | update the text to fix the issue. | Revised  Agree in principle. This sentence is revised.  TGbe editor, please apply the changes with the CID tag (#11044) in 11/22-1267r4 |
| 13467 | Liwen Chu | 9.4.2.311 | 209.44 | the inclusion of HT Operation in the sentence means that once the BSS operating channel is >=80MHz, the EHT Operation Information Present will be 1. | update the text to fix the issue. | Revised  Agree in principle. This sentence is revised.  TGbe editor, please apply the changes with the CID tag (#11044) in 11/22-1267r4 |
| 11045 | Po-Kai Huang | 9.4.2.311 | 209.43 | For the sentence, "The EHT Operation Information Present subfield is set to 1 if the channel width indicated in an HT Operation, VHT Operation, or HE Operation element that is present in the same Management frame is different from the Channel Width field indicated in the EHT Operation Information field." Add "Otherwise, the EHT Operation Information Present subfield is set to 0." after the sentence, so the spec is clear on the intention. | Add "Otherwise, the EHT Operation Information Present subfield is set to 0." after "The EHT Operation Information Present subfield is set to 1 if the channel width indicated in an HT Operation, VHT Operation, or HE Operation element that is present in the same Management frame is different from the Channel Width field indicated in the EHT Operation Information field." | Revised  Agree in principle. Add “otherwise, it is set to 0”  TGbe editor, please apply the changes with the CID tag (#11045) in 11/22-1267r4 |
| 11046 | Po-Kai Huang | 9.4.2.311 | 210.14 | The following sentence is not entirely accurate "The EHT STA obtains the channel configuration information from the EHT Operation Information field, if present, in the EHT Operation element. " Specifically, the primary channel needs to be obtained from HT operation element or 6 GHz Operation Information field in HE Operation element since EHT Operation Information field does not include primary channel indication. | Revise "The EHT STA obtains the channel configuration information from the EHT Operation Information field, if present, in the EHT Operation element. " as "The EHT STA obtains the channel width information and channel center frequency information of EHT BSS bandwidth from the EHT Operation Information field, if present, in the EHT Operation element." | Revised  Agree in principle. This sentence is revised.  TGbe editor, please apply the changes with the CID tag (#11046) in 11/22-1267r4 |
| 11513 | Xiaofei Wang | 9.4.2.311 | 209.36 | the definition for Basic EHT-MCS and Nss set field should be moved to after EHT operation parameters field. | as in comment | Revised  Agree in principle. The definition for Basic EHT-MCS and Nss set field should be placed after the Group Addressed BU Indication Exponent subfield.  TGbe editor, please apply the changes with the CID tag (#11513) in 11/22-1267r4. |
| 11858 | Alfred Asterjadhi | 9.4.2.311 | 209.44 | Add a reference as to where the rules for the BW differences between amendments are specified. | As in comment. | Revised  Agree in principle. Corresponding references are added.  TGbe editor, please apply the changes with the CID tag (#11858) in 11/22-1267r4. |
| 11860 | Alfred Asterjadhi | 9.4.2.311 | 210.03 | The wording on this condition is confusing. Please rephrase to make it clearer. | As in comment. | Revised  The second bullet is revised.  TGbe editor, please apply the changes with the CID tag (#11860) in 11/22-1267r4 |
| 11861 | Alfred Asterjadhi | 9.4.2.311 | 210.09 | Is there a dependence on the value of this field and the previously defined one? Please clarify. | As in comment. | Rejected  There is no dependency between the setting of the Group Addressed BU Indication Limit and the Group Addressed BU Indication Exponent subfields. |
| 11862 | Alfred Asterjadhi | 9.4.2.311 | 212.27 | What is the setting of the bits of the Disabled Subchannel Bitmap that fall outside of the BSS bandwidth? Please clarify | As in comment. | Revised  Agree in principle. The paragraph is revised.  TGbe editor, please apply the changes with the CID tag (#11862) in 11/22-1267r4 |
| 13364 | Liwen Chu | 9.4.2.311 | 212.25 | the bits of Disabled Subchannel Bitmap that are not covered by BSS BW are undefined. | Clarify that those bits are reserved. | Revised  Agree in principle. The paragraph is revised.  TGbe editor, please apply the changes with the CID tag (#11862) in 11/22-1267r4 |
| 12056 | Massinissa Lalam | 9.4.2.311 | 210.20 | I don't see the need to have "CCFS1" subfield. EHT is not supporting non-contiguous operation (like 80+80, or a new 160+160) for a single BSS. For such deployment, MLO should be preferred. As such CCFS1 subfield and any reference to it should be deleted and CCSF0 description in Table 9-401a should be updated to: "For 20, 40, 80, 160 or 320 MHz BSS bandwidth, indicates the channel center frequency index for the 20, 40, 80, 160 or 320 MHz channel on which the EHT BSS operates.". There is zero reason why we should add an extra octet carrying useless information. | As in comment | Rejected  The group discussed this part and could not reach a consensus that would resolve the comment. |
| 12131 | Lei Huang | 9.4.2.311 | 210.22 | When BW = 80 MHz or 160 MHz, 8-bit Disabled Subchannel Bitmap field is enough. | change size of the Disabled Subchannel Bitmap field to 0, 1 or 2 octets. | Revised  Agree in principle. The corresponding text is revised.  TGbe editor, please apply the changes with the CID tag (#12131) in 11/22-1267r4 |
| 12970 | Chunyu Hu | 9.4.2.311 | 209.59 | Improve wording: "to indicate" ==> "that indicates" | As in comment | Revised  Agree in principle. This sentence is revised. And other editorial bugs are fixed.  TGbe editor, please apply the changes with the CID tag (#12790) in 11/22-1267r4 |
| 10990 | Yanjun Sun | 9.4.2.311 | 209.38 | The reference (to Figure 9-1002a) is incorrect and please update it to the correct one. | As in comment | Revised  Agree in principle. This has been resolved by CID 10807. In addition, some clarification texts on the correlation between <EHT-MCS, NSS> and < HE-MCS, NSS > are added in 35.16.1.  TGbe editor, please apply the changes with the CID tag (#10990) in 11/22-1267r4 |

***TGbe editor: Change the following subclause as follows:***

**9.4.2.311 EHT Operation element**

The operation of EHT STAs in an EHT BSS is controlled by the following:

* The HT Operation element, HE Operation element, and EHT Operation element if operating in the 2.4 GHz band
* The HT Operation element, VHT Operation element (if present), HE Operation element, and EHT Operation element if operating in the 5 GHz band
* The HE Operation element and EHT Operation element if operating in the 6 GHz band

The format of the EHT Operation element is shown in Figure 9-1002a (EHT Operation element format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | EHT Operation Parameters | Basic EHT-MCS And Nss Set | EHT Operation Information |
| Octets: | 1 | 1 | 1 | 1 | 4 | 0, 3, 4 or 5[#12131] |

**Figure 9-1002a – EHT Operation element** **format**

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The EHT Operation Parameters field is defined in Figure 9-1002b (EHT Operation Parameters field format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 B5 | B6 B7 |
|  | EHT Operation Information Present | Disabled Subchannel Bitmap Present | EHT  Default PE Duration | Group Addressed BU Indication Limit | Group Addressed BU Indication Exponent | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 2 | 2 |

**Figure 9-1002b – EHT Operation Parameters field format**

[#11513]

The EHT Operation Information Present subfield is set to 1 if the EHT Operation Information field is present and set to 0 otherwise. [#10808] [#11858]The EHT Operation Information Present subfield is set as described in 35.16.1 (Basic EHT BSS operation).

The Disabled Subchannel Bitmap Present subfield is set to 1 if the Disabled Subchannel Bitmap field is present and set to 0 otherwise. [#11859]The Disabled Subchannel Bitmap Present subfield is reserved if the [#10991]EHT Operation Information Present subfield is set to 0.

The EHT Default PE Duration subfield is set to 1 to indicate that the PE field duration for an EHT TB PPDU solicited by a TRS Control subfield is 20 μs and set to 0 to indicate that the PE field duration is the same as that indicated in the HE Operation Parameters field in the HE Operation element.

The Group Addressed BU Indication Limit subfield indicates whether there is a limit on the number of bits [#12970]that indicates the presence of buffered group addressed frames of all other APs affiliated with the same AP MLDs as all nontransmitted BSSIDs in a multiple BSSID set in the TIM element or not.

The Group Addressed BU Indication Limit subfield is set to 0 if one of the conditions is met:

* The AP is not in multiple BSSID set.
* The AP is in a multiple BSSID set and the total number of bits that is needed to indicate the presence of buffered group addressed frames of all other APs affiliated with the same AP MLDs as all nontransmitted BSSIDs in the TIM element is not greater than 48 bits.[#11860]

Otherwise, the Group Addressed BU Indication Limit subfield is set to 1.

The Group Addressed BU Indication Exponent subfield is set to the exponent from which *N* is calculated as defined in 35.3.15.1 (Group addressed frame delivery).

[#11513]The Basic EHT-MCS And NSS Set field indicates the EHT-MCSs for each number of spatial streams in EHT PPDUs that are supported by all EHT STAs in the BSS (including IBSS and MBSS) for transmission and reception. [#10807]The Basic EHT-MCS And NSS Set field is defined in Figure 9-1002ai (EHT-MCS Map (20 MHz-Only Non-AP STA) subfield.

The EHT Operation Information field is present if the EHT Operation Information Present subfield is equal to 1; otherwise it is not present. [#11046]The EHT STA obtains a set of channel configuration parameters from the EHT Operation Information field (if present) which is defined Figure 9-1002c (EHT Operation Information field format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Control | CCFS0 | CCFS1 | Disabled Subchannel Bitmap |
| Octets: | 1 | 1 | 1 | 0, 1 or 2[#12131] |

**Figure 9-1002c – EHT Operation Information field format**

The Control subfield is defined in Figure 9-1002d (Control subfield format),

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B2 | B3 B7 | |
|  | Channel Width | Reserved | |
| Bits: | 3 | 5 |

**Figure 9-1002d – Control subfield format**

[#12970]The Channel Width, CCFS0 and CCFS1 subfields are defined in Table 9-401a (Channel width, CCFS0, and CCFS1 subfields).**Table 9-401a—Channel width, CCFS0, and CCFS1 subfields**

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| Channel Width | This subfield defines the EHT BSS bandwidth. | Set to 0 for 20 MHz EHT BSS bandwidth.  Set to 1 for 40 MHz EHT BSS bandwidth.  Set to 2 for 80 MHz EHT BSS bandwidth.  Set to 3 for 160 MHz EHT BSS bandwidth.  Set to 4 for 320 MHz EHT BSS bandwidth.  Values in the ranges 5 to 7 are reserved. |
| CCFS0 | This subfield defines a channel center frequency for a 20, 40, 80, 160, or 320 MHz EHT BBS. | For 20, 40 or 80 MHz BSS band width, indicates the channel center frequency index for the 20, 40 or 80 MHz channel on which the EHT BSS operates.  For 160 MHz BSS bandwidth, indicates the channel center frequency index of the primary 80 MHz channel.  For 320 MHz BSS bandwidth, indicates the channel center frequency index of the primary 160 MHz channel. |
| CCFS1 | This subfield defines a channel center frequency for a 160 or 320 MHz EHT BBS. | For a 20, 40 or 80 MHz BSS bandwidth, this subfield is set to 0.  For a 160 MHz BSS bandwidth, indicates the channel center frequency index of the 160 MHz channel on which the EHT BSS operates.  For a 320 MHz BSS bandwidth, indicates the channel center frequency index of the 320 MHz channel on which the EHT BSS operates.  . |



The Disabled Subchannel Bitmap subfield is present if the Disabled Subchannel Bitmap Present subfield is equal to 1 and provides a list of subchannels that are punctured within the BSS bandwidth; otherwise it is not present.

The Disabled Subchannel Bitmap subfield is [#12131]an 8-bit or 16-bit bitmap where the lowest numbered bit corresponds to the 20 MHz subchannel that lies within the BSS bandwidth and that has the lowest frequency of the set of all 20 MHz subchannels within the BSS bandwidth. Each successive bit in the bitmap corresponds to the next higher frequency 20 MHz subchannel. [#11862]A bit in the bitmap and that lies within the BSS bandwidth is set to 1 to indicate that the corresponding 20 MHz subchannel is punctured and is set to 0 to indicate that the corresponding 20 MHz subchannel is not punctured. [#11862]A bit in the bitmap that falls outside of the BSS bandwidth is reserved. [#12131]The Disabled Subchannel Bitmap subfield is a 16-bit bitmap if the channel width indicated in the Channel Width subfield is equal to 320 MHz; otherwise, it is an 8-bit bitmap.

**35.16.1 Basic EHT BSS operation**

***TGbe editor: Revised the third paragraph in subclause 35.16.1 as follows:***

An EHT AP shall set the EHT Operation Information Present subfield to 1 to announce an EHT BSS operating channel width through the EHT Operation Information field that is different from the BSS operating channel width that it announces to non-AP non-EHT STAs in the same Management frame if the EHT BSS operating channel width includes at least one punctured 20 MHz subchannel and/or if the announced EHT BSS operating channel width is 320 MHz. Otherwise, the EHT AP shall set the EHT Operation Information Present subfield to 0. [#11044, #11045]

***TGbe editor: Insert the following paragraph in the end of subclause 35.16.1:***

[#10990] If an EHT STA supports transmitting or receiving a PPDU, where the PPDU bandwidth is less than 320 MHz, at an <EHT-MCS, NSS> tuple, where the EHT-MCS is equal to the HE-MCS and less than 12, then it shall also support the corresponding transmitting or receiving <HE-MCS, NSS> tuple, respectively. For an EHT-MCS, the EHT STA shall support an equal or greater NSS with a lower EHT-MCS.