IEEE P802.11
Wireless LANs

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| CR for CIDs Related to EHT Operation element |
| Date: 2021-04-02 |
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 Abstract

This submission proposes resolutions for following 8 CIDs received for TGbe CC34:

1729, 1806, 1904, 1941, 2247, 2488, 2546, 3246

Revisions:

* Rev 0:
	+ Initial version of the document.
* Rev 1:
	+ Revised some typos
* Rev 2:
	+ Fix one TBD
* Rev 3-4:
	+ Update based on received comments

This text is being prepared for the following SPs/motions:

802.11be supports the definition of an EHT Operation element with the following fields to indicate 320/160+160 MHz BSS bandwidth:

• Channel Width field

• CCFS field

[Motion 111, #SP0611-25, [19] and [306]]

802.11be supports that in the 6 GHz band, an EHT AP may announce different BSS operating bandwidth to non-EHT STAs than the BSS operating bandwidth it announces to EHT STAs when the EHT bandwidth covers disallowed 20 MHz channels and/or when the announced EHT bandwidth is not supported by non-EHT amendments. The advertised BSS operating bandwidth transmitted to an EHT STA shall include the advertised BSS operating bandwidths for non-EHT STA.

[Motion 112, #SP53, [19] and [176]]

802.11be supports the definition of an EHT operation element to indicate the channel configuration for EHT STA, which does not need to combine with the indication of CCFS0 and CCFS1 in HE operation elements at 6 GHz.

[Motion 112, #SP54, [19] and [307]]

3 bits of Channel Width field in the EHT Operation element are used for indicating the channel width for an EHT BSS as follows:

• 0: 20

• 1: 40

• 2: 80

• 3: 160

• 4: 320

• 5~7: reserved

[Motion 144, #SP317, [35] and [308]]

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 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe 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** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 1729 | Hanseul Hong | 73/3 | 9.4.2.295a | Define the channel configuration info in EHT Operation element | As in comment | **Revised**Agree with the comment and revise this sentence as following:The EHT STA gets the channel width and the channel center frequency info from the EHT Operation element if operating in the 6 GHz band.**TGbe editor please implement changes as shown in doc 11-21/0573r4 tagged as 1729.** |
| 1806 | James Yee | 73/5 | 9.4.2.295a | Why is only the "6GHz band" mentioned here and not other bands? | Clarify | **Rejected**On the one hand, the EHT AP will not set up an EHT BSS with a 320 MHz bandwidth in the 5 GHz band due to no adequate contiguous spectrum. On the other hand, the 5 GHz band dosen’t support the static puncture.  |
| 2488 | Po-Kai Huang | 73/26 | 9.3.3.10 | Resolve the TBD for CCFS by aligning the design for 11ax when the channel bandwidth is 20 MHz, 40 MHz, 80 MHz, and 160 MHz. This removes the need to insert formula for CCFS computation, which requires additoinal test and is error prone. | Resolve the TBD for CCFS by aligning the design for 11ax when the channel bandwidth is 20 MHz, 40 MHz, 80 MHz, and 160 MHz. | **Revised**Agree with the comment to define CCFS subfields of EHT Operation Information. **TGbe editor please implement changes as shown in doc 11-21/0573r4 tagged as 2488.** |
| 1904 | Jeongki Kim | 73/26 | 9.4.2.295a | The definition and encoding of CCFS of EHT Operation Information subfields are still TBD. Need to define the definition and ecoding of CCFS. | Remove the TBDs in the row and describe the definition and Ecoding of CCFS subfield in the table 9-322al | **Revised**Agree with the comment to define CCFS subfields of EHT Operation Information. **TGbe editor please implement changes as shown in doc 11-21/0573r4 tagged as 1904.** **The proposed resolution is the same as CID 2488.** |
| 1941 | Jian Yu | 73/26 | 9.4.2.295a | Define CCFS for EHT | As in comment | **Revised**Agree with the comment to define CCFS subfields of EHT Operation Information. **TGbe editor please implement changes as shown in doc 11-21/0573r4 tagged as 1941.****Note to the Editor: The proposed resolution is the same as CID 2488.** |
| 2247 | Massinissa Lalam | 72/52 | 9.4.2.295a | "The HT Operation element, VHT Operation element (if present), HE Operation element, and EHT Operation element if operating in the 5 GHz band". Since an HE STA is also a VHT STA, I'm assuming that if HE Operation is present, then VHT Operation element is also present in the 5 GHz. Add a note explaining why VHT Operation could be optional in the 5 GHz band (or refer to the adequate subclause if this behavior is already described). | As in comment | **Rejected**This behavior is already described in P802.11ax D8.0. Please refer to subclause 26.17.1 in P802.11ax D8.0. The text is described as: “An HE AP or HE mesh STA shall set the VHT Operation Information Present field in the HE Operation element to 1 if a VHT Operation element is not present in the frame that carries the HE Operation element and the frame is sent in the 5 GHz band.” |
| 2546 | Robert Stacey | 73/14 | 9.3.3.10 | A comprehensive list of BSS bandwidths is not necessary. All we need is one entry that says "find the BSS bandwidth in the legacy elements" and values for each of the new BSS bandwidths (currently only one: 320 MHz). | Change encoding: Set to 0 to indicate that the BSS bandwidth is defined in the Channel Width field of the HE Operation element. Set to 1 to indicate that the BSS bandwidth is 320 MHz. | **Rejected**Since EHT supports the static channel puncture, different channel widths may be separately advertised to EHT STAs and non-EHT STA. For example, for EHT STAs, the channel width is 160 MHz with some 20 MHz channels are punctured. But for HE/VHT STAs, the channel width may be 80 MHz. Hence, the EHT STA will ignore the channel configuration info carried within VHT and HE operation elements. |
| 3246 | Young Hoon Kwon | 73/14 | 9.3.3.10 | Number of bits for Channel Width subfield is not described. Add the bit-width for Channel Width subfield somewhere in this sub-clause. | As shown in the comment. | **Revised**Agree with the comment to fix the number of bits for Channel Width subfield according to the Motion.**TGbe editor please implement changes as shown in doc 11-21/0573r4 tagged as 3246.** |

***TGbe editor: Please note baselines are REVmd D5.0, 11ax D8.0, 11be D0.3 and doc 11-21/0573r4***

**9.4.2.295a 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 the EHT Operation element if operating in the 2.4 GHz band

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

— The HE Operation element and the EHT Operation element if operating in the 6 GHz band

The format of the EHT Operation element is shown in Figure xxx (EHT Operation element format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extention | EHT Operation Information |
| Octets: | 1 | 1 | 1 | 3 |

**Figure 9-788ee – EHT Operation element**

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

The structure of the EHT Operation Information field is defined in Figure 9-xxxx (EHT Operation Information field format).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Control | CCFS0 | CCFS1 |
| Octets: | 1 | 1 | 1 |

**Figure 9-xxx – EHT Operation Information field format** **(#2488, #1904, #1941)**

|  |  |  |
| --- | --- | --- |
| The Control subfield is defined as in Figure 9-xxx (Control subfield). | B0 B2 | B3 B7 |
|  | Channel Width | Reserved |
| Bits: | 3 | 5 |

**Figure 9-xxx Control subfield format (#3246)**

The EHT STA gets the channel width and the channel center frequency information from the EHT Operation element if operating in the 6 GHz band. (#1729) The subfields of EHT Operation Information field are defined in Table 9-xxx (EHT Operation Information field).

**Table 9-322al- EHT Operation Information field**

|  |  |  |
| --- | --- | --- |
| Subfield | Definition | Encoding |
| Channel Width | This field 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 range 5 to 7 are reserved.(#3246) |
| CCFS0 |  Defines the channel center frequency for a 20, 40, 80, 160, or 320 MHz EHT BSS. (#2488,#1904, #1941) |  For a 20, 40, or 80 MHz EHT BSS bandwidth, indicates the channel center frequency index for the 20, 40, or 80 MHz channel on which the EHT BSS operates.For a 160 MHz EHT BSS bandwidth, indicates the channel center frequency index of the primary 80 MHz channel.For a 320 MHz EHT BSS bandwidth, indicates the channel center frequency index of the primary 160 MHz channel. (#2488, #1904, #1941) |
| CCFS1 | Defines the channel center frequency for a 160 or 320 MHz EHT BSS. (#2488, #1904, #1941) | For a 20, 40, or 80 MHz EHT BSS bandwidth, this subfield is set to 0.For a 160 MHz EHT BSS bandwidth, indicates the channel center frequency index of the 160 MHz channel on which the EHT BSS operates.For a 320 MHz EHT BSS bandwidth, indicates the channel center frequency index of the 320 MHz channel on which the EHT BSS operates. (#2488, #1904, #1941)  |

**SP: which option do you prefer?**

* Option 1: One CCFS field is used to signal EHT BSS bandwidth
* Option 2: Two CCFS fields are used to signal EHT BSS bandwidth
* Abstain

**Do you support the resolutions for the following CIDs in doc 11-21/0573r4?**

1729, 1806, 1904, 1941, 2247, 2488, 2546, 3246