IEEE P802.11
Wireless LANs

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| CR on CID 1279 |
| Date: 2021-04-15 |
| Author: |
| Name | Affiliation | Address | Phone | Email |
| Yan Xin | Huawei Technologies | 303 Terry Fox Drive, Suite 400, Ottawa, Ontario K2K 3J1 |  | yan.xin@huawei.com |
| Ross Jian Yu | Huawei Technologies |  |  | ross.yujian@huawei.com |
| Edward Au | Huawei Technologies |  |  | edward.ks.au@huawei.com |
| Shimi Shilo | Huawei Technologies |  |  | shimi.shilo@huawei.com |

This submission includes the resolution for CID 1279 on the terminologies of 80 MHz segment and 20 MHz frequency segment in P802.11be D0.4.

##### Revision history:

##### R0 – initial version. To get the group’s view on the alternative options.

R1 – some editorial changes.

R2 – proposed text changes in P802.11be D0.4 based on the SP result obtained at the TGbe PHY session on March 22, 2021.

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| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Resolution |
| **1279** | 36.3.2.1 | 175 | 45 | "composed of multiple 80 MHz segments." but "segments" is the wrong term - should be "frequency subblocks". E.g. look at Table 36-10 where all bandwidths only have 1 frequency segment | In clause 36, change "80MHz segment" and "80MHz frequency segment" to "80MHz frequency subblock". Delete "and frequency segment" and "per frequency segment" (or change to "and/per 80MHz frequency subblock". Keep "into one frequency segment". Delete Nseg row in Table 36-10. figure out a new term for "20 MHz segment" at P241L33.5 (perhaps "20 MHz" or "20 MHz frequency portion"). Change "on frequency segment i80FS" to "on frequency subblock i80Fs" . Change i080FS to i80FSB | ACCEPTED*To TGbe Editor: please revise the text in P802.11be D0.4 as proposed in 21/489r2* |

***Discussion***

- The term “80 MHz segment / frequency segment” is extensively used through Clause 36 in D0.3 and other clauses, for example, in

36.3.2.1 Subcarriers and resource allocation for wideband;

36.3.2.3 Subcarriers and resource allocation for multiple RUs;

36.3.11.7 U-SIG

36.3.11.7.4 Encoding and modulation

36.3.11.8 EHT-SIG

36.3.11.11 Preamble punctured EHT PPDU

36.3.12.3 Coding

36.3.12.5 Segment parser

* + - 1. Constellation mapping

9.4.1.67b EHT Compressed Beamforming Report field

* The term “80 MHz subblock / frequency subblock” is also widely used through Clause 36 in D0.3, for example, in

36.3.6.10 Construction of Data field in an EHT PPDU

36.3.11.8 EHT-SIG

36.3.12.5 Segment parser

36.3.12.8 LDPC tone mapper

* In the most of cases, “frequency segment / frequency subblock” represents an 80 MHz spectrum range, with exception such as:

36.3.6.10 Construction of Data field in an EHT PPDU





and

36.3.9 Time-related parameters



**Option 1:**

Use “frequency subblock” for up to 80 MHz and use “frequency segement” for a contigous spectrum.

Potential Action for Option 1:

1. Search for the terms of 80 MHz segment and frequency segment which are used to represent 80 MHz in the P802.11be draft, and replace all of them with 80 MHz frequency subblock.
2. Replace segment parser with frequency subblock parser in Revme.

**Option 1a:**

Use “frequency subblock” for up to 80 MHz and use “frequency segment” for a contigous spectrum.

Potential Action for Option 1a:

1. Search for the terms of up to 80 MHz segment and frequency segment which are used to represent up to 80 MHz in the P802.11be draft, and replace all of them with up to 80 MHz frequency subblock.
2. Keep segment parser unchanged

**Option 2:**

Use “frequency segment” for 80 MHz and use another term (e.g., “frequency block”) for a contigous spectrum.

Potential Action for Option 2:

1. Search for the terms of 80MHz subblock and frequency subblock which are used to represent 80 MHz in the P802.11be draft, and replace all of them with 80 MHz frequency segment.
2. Replace segment with frequency block in Revme.

**End of discussion**

A SP run at TGbe PHY adhoc session on March 22, 2021.

SP#1: Do you agree that:

Use “frequency subblock” for up to 80 MHz and use “frequency segment” for a contiguous spectrum.

Potential Actions:

1.Search for the terms of up to 80 MHz segment and frequency segment which are used to represent up to 80 MHz in the P802.11be draft and replace all of them with up to 80 MHz frequency subblock.

2.Keep segment parser unchanged.

 Yes/No/Abs: 29/2/13

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* ***Proposed text changes (related to 80 MHz segment(s), 80 MHz frequency subblock(s)) to P802.11be D0.4***

 ***TGbe editor: please revise P802.11be D0.4 with the following text changes***

P22L14: Figure 36-7 - Allowed 52+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU

P22L19: Figure 36-10 - Allowed 106+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU

P25L43: Table 9-91j-Subcarrier indices when feedback request does not cover the entire 80 MHz subblock

P25L44: Table 9-91k - Subcarrier indices when feedback request cover the entire 80 MHz subblock for Ng = 4

P25L45: Table 9-91l - Subcarrier indices when feedback request cover the entire 80 MHz subblock for Ng = 16

P87L16: (**Table 9-29j1—Encoding of PS160 and RU Allocation subfields in an EHT variant User Info field**) **PS160 subfield/** **B0 of the RU Allocation subfield**: 0-3: 80 MHz subblock where the RU is located

P88L18, Table 9-29j1: **PS160 subfield/** **B0 of the RU Allocation subfield**: 0-3: 80 MHz subblock where the RU is located

P102L61: Table 9-91j (Subcarrier indices when feedback request does not cover the entire 80 MHz subblock), Table 9-91k (Subcarrier indices when feedback request cover the entire 80 MHz subblock for Ng= 4), and Table 9-91l (Subcarrier indices when feedback request cover the entire 80 MHz subblock for Ng =16)

P103L1: Table 9-91j - Subcarrier indices when feedback request does not cover the entire 80 MHz subblock

P104L1: Table 9-91k - Subcarrier indices when feedback request does not cover the entire 80 MHz subblock for Ng= 4

P104L20: Table 9-91l - Subcarrier indices when feedback request does not cover the entire 80 MHz subblock for Ng=16

P104L52: For an EHT NDP Announcement frame of bandwidth larger than or equal to 80 MHz, in each 80 MHz subblock,

P105L3: in Table 9-91j (Subcarrier indices when feed­back request does not cover the entire 80 MHz subblock), Table 9-91k (Subcarrier indices when feedback request cover the entire 80 MHz subblock for Ng = 4), and Table 9-91l (Subcarrier indices when feedback request cover the entire 80 MHz subblock for Ng = 16),

P261L45: An EHT PPDU spanning 160 MHz or wider is composed of multiple 80 MHz subblocks. The tone plan for each of the 80 MHz segments is identical to that of an 80 MHz EHT PPDU. Any 80 MHz subblock in an 80/160/320 MHz EHT PPDU, if it is punctured or used with an OFDMA transmission, uses the tone plan shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU). Each nonpunctured 80 MHz subblock in a 160/320 MHz PPDU uses a 996-tone RU as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU).

P262L37: with the exception of pilot locations and the exception of any punctured 80 MHz subblock

P272L23: The allowed 52+26 tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU are indicated in Figure 36-7 (Allowed 52+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU).

P272L38: **Figure 36-7—Allowed 52+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU**

P273L23: The allowed 106+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU are indicated in Figure 36-10 (Allowed 106+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU).

P273L37: **Figure 36-10—Allowed 106+26-tone MRUs in each 80 MHz subblock of an 80 MHz, 160 MHz, or 320 MHz EHT PPDU.**

P284L2: For OFDMA transmission in 160 MHz and 320 MHz, the allowed combinations for a 484+242-tone MRU in OFDMA 80 MHz EHT PPDU are allowed in each 80 MHz subblock of OFDMA 160 MHz and 320 MHz EHT PPDU.

P290L60: It is mandatory for non-AP STA to support the transmission and reception of 484+242-tone MRU in each 80 MHz subblock, 996+484-tone MRU in the primary 160 MHz channel and the secondary 160 MHz channel, 2×996+484-tone MRU, 3×996-tone MRU, and 3×996+484-tone MRU in 80/160/320 MHz PPDU in OFDMA unless the MRU size is larger than its supported bandwidth.

P296L60: In particular, Figure 36-24 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for an EHT MU PPDU) shows the transmit process for the L-SIG, RL-SIG, and U-SIG fields of an EHT MU PPDU using one frequency subblock. These transmit blocks are also used to generate the L-STF and L-LTF fields of the EHT MU PPDU with the following exceptions:

P297L5: NOTE—For an EHT MU PPDU, the duplication on 20 MHz channels is subject to the availability of 20 MHz channels in the case of preamble puncturing. The U-SIG contents may be different in different 80 MHz subblock for PPDU BW greater than 80 MHz.

P341L46: (**36.3.12.8.2 EHT-SIG content channels**) A STA only needs to process up to one 80 MHz subblock of the pre-EHT modulated fields to get all the assignment information for itself. No 80 MHz subblock change is needed while processing L-SIG, U-SIG, and EHT-SIG.

P390L10: (**36.3.12.11.2 Preamble puncturing for PPDUs in an OFDMA transmission**) U-SIG contains signaling of the punctured 20 MHz channels in the 80 MHz subblock where it belongs (see Table 36-27 (U-SIG field of an EHT MU PPDU)).

P400L5: (**36.3.13.5 Segment parser**) is bit *k* of frequency subblock (or RU in 80 MHz subblock) *l*

P405L6: (**36.3.13.7 Constellation mapping**) For larger RU sizes, DCM is performed within each 80 MHz subblock.

P494L57: (B.4.36a.2 EHT PHY features) 52+26-tone RU in OFDMA in each 80 MHz subblock

P495L5: (B.4.36a.2 EHT PHY features) 106+26-tone RU in OFDMA in each 80 MHz subblock

P355L50: (**36.3.12.8.3 Common field for OFDMA transmission**) (#3062)(#1403)For an MU-MIMO allocation of RU/MRU size greater than 242 subcarriers in an OFDMA transmission, the dynamic split of User fields between EHT-SIG content channel 1 and EHT-SIG content channel 2 is decided by the AP (on a per case basis) and signaled by the AP using the RU Allocation subfields in each EHT-SIG content channel. The dynamic split of User fields can be different in each 80 MHz subblock if the Bandwidth of the PPDU is greater than or equal to 160 MHz. The dynamic split may be different per 80 MHz subblock.

P371L25: (**36.3.12.8.6 Encoding and modulation**) In terms of EHT-SIG for OFDMA transmission, for EHT-SIG content channel *c* (*c* = 1 to 2) in 80 MHz subblock *l*, the complex number assigned to the *k-*th data subcarrier of the *n-*th symbol is denoted *dknc*.

P373L53: (**36.3.12.8.6 Encoding and modulation**) (#2813)(#3108)For OFDMA transmission and non-OFDMA transmission to multiple users, a 160 MHz PPDU contains two EHT-SIG content channels for each of the two 80 MHz subblocks, each of which is duplicated as shown in Figure 36-43 (EHT-SIG content channels and their duplication in a 160 MHz PPDU for OFDMA transmission and non-OFDMA transmission to multiple users) according to Equation (36-22) and 36.3.12.8.2 (EHT-SIG content channels).

P374L1: (**36.3.12.8.6 Encoding and modulation**) EHT-SIG content channels with the same index may carry different information in different 80 MHz subblocks for EHT-SIG for OFDMA transmission but shall carry the same information in different 80 MHz subblocks for EHT-SIG for non-OFDMA transmission to multiple users.

P374L50, P374L55, P375L1: (**36.3.12.8.6 Encoding and modulation**) (#3108)For OFDMA transmission and non-OFDMA transmission to multiple users, a 320 MHz PPDU contains two EHT-SIG content channels for each of the four 80 MHz subblocks, each of which is duplicated as shown in Figure 36-44 (EHT-SIG content channels and their duplication in a 320 MHz PPDU for OFDMA transmission and non-OFDMA transmission to multiple users) according to Equation (36-22) and 36.3.12.8.2 (EHT-SIG content channels). EHT-SIG content channels with the same index may carry different information in different 80 MHz subblocks for EHT-SIG for OFDMA transmission but shall carry the same information in different 80 MHz subblocks for EHT-SIG for non-OFDMA transmission to multiple users.

P405L44: (**36.3.13.8 LDPC tone mapper**) For an RU or MRU that spans multiple 80 MHz subblocks, LDPC tone mapping is performed separately in each subblock on the portion of the RU/MRU falling within that subblock.

P407L2: (**36.3.13.8 LDPC tone mapper**) LDPC tone mapper for a 26-, 52-, 52+26-, 106-, 106+26-, 242-, 484-, and 996-tone RU/MRU is defined as one subblock. LDPC tone mapping is performed separately for each 80 MHz subblock.

* ***Proposed text changes to P802.11be D0.4 (related to 20 MHz frequency segment )***

 ***TGbe editor: please revise P802.11be D0.4 with the following text changes***

P345L21: (**Table 36-32—Common field for OFDMA transmission *(continued)***) – Description: Each RU Allocation-1 subfield in an EHT-SIG content channel corresponding to a 20 MHz frequency subblock indicates the RU assignment, including the size of the RU(s) and their placement in the frequency domain, to be used in the EHT modulated fields of the EHT MU PPDU in the frequency domain, where the subcarrier indices of the RU(s) meet the conditions in Table 36-33 (RUs associated with each RU Allocation subfield for each EHT-SIG content channel and PPDU bandwidth).



P346L25: (**Table 36-32—Common field for OFDMA transmission *(continued)***) – Description: Each RU Allocation-2 subfield in an EHT-SIG content channel corresponding to a 20 MHz frequency subblock indicates the RU assignment, including the size of the RU(s) and their placement in the frequency domain, to be used in the EHT modulated fields of the EHT MU PPDU in the frequency domain, where the subcarrier indices of the RU(s) meet the conditions in Table 36-33 (RUs associated with each RU Allocation subfield for each EHT-SIG content channel and PPDU bandwidth).

P372L58: For OFDMA transmission and non-OFDMA transmission to multiple users, a 40 MHz PPDU contains two EHT-SIG content channels, each occupying a 20 MHz frequency subblock as shown in Figure 36-41 (EHT-SIG content channel for a 40 MHz PPDU for OFDMA transmission and non-OFDMA transmission to multiple users) according to Equation (36-22) and 36.3.12.8.2 (EHT-SIG content channels).

* ***Discussion on usage of “frequency segment” P802.11be D0.4***

**The terminology of “frequency segment” in the following paragraphs will be kept as they are in P802.11be D0.4**

P296L59: In particular, Figure 36-24 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for an EHT MU PPDU) shows the transmit process for the L-SIG, RL-SIG, and U-SIG fields of an EHT MU PPDU using one frequency segment.

P297L31: Figure 36-25 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields of an EHT TB PPDU) shows the transmit process for the L-SIG, RL-SIG, and U-SIG fields of an EHT TB PPDU using one frequency segment. The BCC encoder and interleaver are not used when generating the L-STF and L-LTF fields.



P297L61: Figure 36-26 (Transmitter block diagram for the EHT-SIG field) shows the transmit process for the EHT-SIG field of an EHT MU PPDU using one frequency segment. This block diagram is for transmitting EHT-SIG in one 20 MHz subchannel.

P299L30: Figure 36-28 (Transmitter block diagram for the UL transmission or DL non-MU-MIMO transmission of a Data field with LDPC encoding on a RU/MRU less than or equal to 996-tone RU) shows the transmitter blocks for the UL transmission or DL non-MU-MIMO transmission of a Data field with LDPC encoding on a RU/MRU less than or equal to 996 tone for a single frequency segment.

P302L53: (**36.3.7.2 Construction of L-STF)** e) CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 36.3.12.2.1 (Cyclic shift for pre-EHT modulated fields).

P303L13: (**36.3.7.3 Construction of L-LTF)** e) CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described 36.3.12.2.1 (Cyclic shift for pre-EHT modulated fields).

P303L46: (**36.3.7.4 Construction of L-SIG**) i) CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 36.3.12.2.1 (Cyclic shift for pre-EHT modulated fields).

P304L17: (**36.3.7.5 Construction of RL-SIG**) i) CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 36.3.12.2.1 (Cyclic shift for pre-EHT modulated fields).

P304L52: (**36.3.7.6 Construction of U-SIG**) h) CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 36.3.12.2.1 (Cyclic shift for pre-EHT modulated fields).

P305L24: (**36.3.7.7 Construction of EHT-SIG**) h) CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 36.3.12.2.1 (Cyclic shift for pre-EHT modulated fields).

P305L41: (**36.3.7.8 Construction of EHT-STF**) b) CSD: Apply CSD for each spatial stream and frequency segment as described in 36.3.12.2.2 (Cyclic shift for EHT modulated fields).

P306L3: (**36.3.7.9 Construction of EHT-LTF**) c) CSD: Apply CSD for each spatial stream and frequency segment as described in 36.3.12.2.2 (Cyclic shift for EHT modulated fields).

P306L52: (**36.3.7.10 Construction of Data field in an EHT PPDU**) k) Segment deparser: In a 2x996-tone RU, 4x996-tone RU, 996+484-tone MRU, 996+484+242-tone MRU, 2x996+484-tone MRU, 3x996-tone MRU, or 3x996+484-tone MRU, merge the multiple frequency subblocks into one frequency segment as described in 36.3.13.9 (Segment deparser). This block is bypassed for RUs or MRUs of other sizes.

P306L63: (**36.3.7.10 Construction of Data field in an EHT PPDU**) n) CSD: Apply CSD for each spatial stream and frequency segment as described in 36.3.12.2.2 (Cyclic shift for EHT modulated fields).

P441L61: (**36.3.19.3 Transmit center frequency and symbol clock frequency tolerance**) Transmit center frequency and the symbol clock frequency for all transmit antennas and frequency segments shall be derived from the same reference oscillator.

P442L33: (**36.3.19.4.3 Transmitter constellation error**) The relative constellation RMS error in the test, calculated by first averaging over subcarriers, frequency segments, EHT PPDUs, and spatial streams (see Equation (36-98)) as described in 36.3.19.4.4 (Transmitter modulation accuracy (EVM) test)) shall not exceed a data-rate dependent value according to Table 36-63 (Allowed relative constellation error versus constellation size and coding rate).

* ***Discussion on usage of “20 MHz subchannel” or “20 MHz subband” in P802.11be D0.4***

**The terminologies of “20/40 MHz subchannel” and “20/40 MHz subband” are adopted in 802.11be D0.4 as used 802.11ax. Propose to keep the usage of the terminologies as they are in 802.11be D0.4.**