IEEE P802.11
Wireless LANs

|  |
| --- |
| CC36 - CR for CIDs on 36.3.2.1 |
| Date: 2021-10-12 |
| Author: |
| Name | Affiliation | Address | Phone | Email |
| Yan Xin | Huawei Technologies | 303 Terry Fox Dr., Suite 400, Ottawa, Ontario K2K 3J1 |  | yan.xin@huawei.com |
| Shimi Shilo | Huawei Technologies |  |  | shimi.shilo@huawei.com |
| Edward Au | Huawei Technologies |  |  | edward.ks.au@huawei.com |
| Eunsung Park | LG Electronics |  |  | esung.park@lge.com |

This submission includes the resolutions for 13 CIDs:

4636, 4637, 4638, 4680, 4790, 5401, 5402, 5403, 5404, 5463, 6782, 7132, 7133

on subclause 36.3.2.1 of P802.11be D1.0.

The baseline document is 802.11be D1.2.

##### Revision history:

##### R0 – initial version

**CID: 4636**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 4636 | 36.3.2.1 | 338 | 3 | Misleading title "Subcarriers and resource allocation for wideband". The content of this section seems to be "Subcarriers and resource allocation for single RUs" in contrast to the title of section 36.3.2.2 which is labelled "Subcarriers and resource allocation for multiple RUs". Related, "wideband" has been used for 80 MHz PPDUs and above, but this describes 20 and 40 MHz PPDUs also. | Rename to "Subcarriers and resource allocation for single RUs". IF any content does not belong under this heading then move to an earlier section (e.g. "General") | REVISEDAgree with the comment in general with a modification of the title of subclause 36.3.2.1.TGbe editor: Please revise the title of subclause 36.3.2.1 in 802.11be D1.2 as modified in 11-21/1677r0. |

***Discussion***

In Subclause 36.3.2.1 (Subcarriers and resource allocation for wideband) in 802.11be D1.0, the text in the first paragraph (P338L5-7) covers the general description on the subcarrier spacing for any EHT PPDU, and the text in the second paragraph discusses the EHT tone plan and RU locations for a 20 MHz, 40 MHz, 80 MHz, 160 MHz and 320 MHz EHT PPDU rather than only for a wideband PPDU (EHT PPDU with bandwidth equal to or larger than 80 MHz).



Since Subclause 36.3.2.1 in 802.11be D1.0 includes the general description on the subcarriers and resource allocation for both single RU and multiple RUs in an EHT PPDU, the title of subclause 36.3.2.1 is revised as below.

TGbe editor: please rename Subclause 36.3.2.1 (802.11be D1.2) as follows:

36.3.2.1 Subcarriers and resource allocation in EHT PPDUs (#4636)

**CID: 4637, 4638, 7132**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 4637 | 36.3.2.1 | 338 | 13 | Fig 36-4 is elsewhere described as a "tone plan" so using "tone plans" is probably incorrect. Worse, we seem to have lost the notion of RUs (c.f. L10-11: "The EHT tone plan and RU locations ...") | Try "The EHT tone plan and RU locations for each of the 80 MHz subblocks is identical to that of an 80 MHz EHT PPDU. (#1242)(#1282)(#2691)(#2944)(#2945)(#3163)If an 80 MHz subblock in an 80/160/320 MHz PPDU isnonpunctured and the entire 80 MHz subblock is used for an RU or as part of an RU or MRU, the 80 MHzsubblock uses a 996-tone RU as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#1984)).Otherwise, the EHT tone plan and RU locations for the 80 MHz subblock are shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU""EHT PPDU(#1984)) excluding the 996-tone RU." | REVISEDAgree with the comment in general with editorial changes.TGbe editor: Please revise the text in P338L11-20 in 802.11be D1.0 (P438L2-12 in 802.11be D1.2) as modified in 11-21/1677r0. |
| 4638 | 36.3.2.1 | 338 | 12 | Singular verb when a plural verb is needed | Change to "The EHT tone plan and RU locations for an 80 MHz PPDU are given " | ACCEPTED |
| 7132 | 36.3.2.1 | 338 | 19 | Elaborate "Otherwise". | Change Otherwise" to "If an 80 MHz subblock contains RUs smaller than 996 tones or if parts of the 80 MHz subblock are punctured, ..." | ACCEPTED |

TGbe editor: Please revise the text in P338L11-20 in 802.11be D1.0 (P438L2-12 in 36.3.2.1 in 802.11be D1.2) as follows:

The EHT tone plan and RU locations for an 80 MHz PPDU are given in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#1984)). (#1279)The tone plan and RU allocations(#4637) for each of the 80 MHz subblocks are identical to those of an 80 MHz EHT PPDU (#1242)(#1282)(#2691)(#2944)(#2945)(#3163). If an 80 MHz subblock in a 160 MHz or 320 MHz (#6782) EHT PPDU is nonpunctured and the entire 80 MHz subblock is used as part of an RU or MRU, the 80 MHz subblock uses a 996-tone RU as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#1984)). (#7132)If an 80 MHz subblock contains RUs smaller than 996 tones or if parts of the 80 MHz subblock are punctured, the 80 MHz subblock uses the tone plan and RU allocations (#4637) as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#1984)) excluding the 996-tone RU.

**CID: 4680**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 4680 | 36.3.2.1 | 339 | 19 | Remove all the single RU that are not defined and adjust the RU index correspondingly，since they do not exist. The insert of those undefined RU make it confused. | As in comment | REJECTED |

***Discussion***

Keep the index of RU19 for “26-tone” RU in Tables 36-5, 36-6 and 36-7 in order to reuse HE RU Allocation subfield for each 80 MHz subblock in EHT.

Reference: RU19 is not defined in EHT (see 11-20/1845r4, [#SP332] in 11-20/566r96, Motion#144 in 11-20/841r39).

**CID: 6782, 5401, 5402, 5463**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 6782 | 36.3.2.1 | 338 | 41 | The "NOTE" after Fig 36-4 can be limited in scope to EHT-DUP only, since the preceding paragraph provides a complete description of the tone plan for both OFDMA and non-OFDMA, punctured and non-punctured scenarios, with the sole exception of EHT-DUP. As it is currently written, the NOTE is confusing as there seems to be some duplication/overlap of information with the preceding paragraph. | Suggested change:"NOTE--For an EHT PPDU using non-OFDMA transmission, the The tone plan of an 80 MHz EHT MU PPDU in EHT DUP mode (described in 36.3.5 (EHT duplicate transmission)) is identical to that of a DL-OFDMA transmission comprising two 484-tone RUs as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#1984)). , and the tone plan of a nonpunctured 80 MHz EHT PPDU that is not an EHT MU PPDU in EHT DUP mode is identical to that of HE PHY defined in 27.3.2 (Subcarrier and resource allocation), with the exception of pilot locations. The tone plan of a nonpunctured 160 MHz EHT PPDU is identical to that of HE PHY defined in 27.3.2 (Subcarrier and resource allocation), with the exception of pilot locations." | REVISEDRevise the text in the P338L15 with discussion on the tone plan and RU allocations of 80 MHz subblocks in a 160 MHz or 320 MHz EHT PPDU. Then discuss the tone plan and RU allocations of 80 MHz EHT MU PPDU that is either in EHY DUP mode or not in NOTE.TGbe editor: Please revise the text in P338L15 in 802.11be D1.0 (P438L6 in 802.11be D1.2)as proposed in 11-21/1677r0.  |
| 5401 | 36.3.2.1 | 338 | 41 | The EHT DUP mode is only applicable to the nonpunctured scenario. Better to revise the sentence to include the term "nonpunctured". For example, revise the beginning of the sentence to "For a nonpunctured EHT PPDU using non-OFDMA transmission." Alternatively, change "the tone plan of an 80 MHz EHT MU PPDU" to "the tone plan of a nonpunctured 80 MHz EHT MU PPDU". | Please refer to my comment. | REVISEDAgree with the comment in principle. Revise the text combined with the consideration of CID#4637, i.e., revise “tone plan” to “tone plan and RU allocations” TGbe editor: Please revise the NOTE in P338L41-47 in 802.11be D1.0 (P438L32-39 in 802.11be D1.2) as proposed in 11-21/1677r0. |
| 5402 | 36.3.2.1 | 338 | 45 | There is technically nothing wrong to say that the tone plan of a nonpunctured 80 MHz EHT PPDU that is not an EHT MU PPDU in EHT DUP mode is identical to to that of HE PHY defined in 27.3.2, with the exception of pilot locations. However, since the RU996 tone plan in an 80 MHz EHT PPDU has been defined in Figure 36-4, why don't we simply refer to it? Ditto P338L46. | Replace the tone plan reference with the RU996 tone plan in an 80 MHz EHT PPDU has been defined in Figure 36-4. | REVISEDAgree with the comment in principle. Revise the text by referring Fig. 36-4. The sentence related to 160 MHz EHT PPDU in P338L46 has been removed. No need to revise it.TGbe editor: Please revise the NOTE in P338L41-47 in 802.11be D1.0 (P438L32-39 in 802.11be D1.2) as proposed in 11-21/1677r0. |
| 5463 | 36.3.2.1 | 338 | 44 | The sentence is too long and difficult to read. | Change ", and the" to ". The" | ACCEPTED |

TGbe editor: Please revise the NOTE in P438L32-39 in 36.3.2.1 in 802.11be D1.2 as:

(#3094)(#1283)NOTE - For an EHT PPDU using non-OFDMA transmission, the tone plan and RU allocations (#4637) of a nonpunctured (#5401) 80 MHz EHT MU PPDU in EHT DUP mode (described in 36.3.5 (EHT duplicate transmission)) are identical to those of a DL-OFDMA transmission comprising two 484-tone RUs as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#1984)).The tone plan and RU allocations (#4637) of a nonpunctured 80 MHz EHT PPDU that is not an EHT MU PPDU in EHT DUP mode are defined by a 996-tone RU as shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU(#5402) . .

**CID: 5403, 7133, 4790**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 5403 | 36.3.2.1 | 338 | 53 | Firstly, please change "DC tone" to "DC subcarrier" for unification of terminology. The D1.0 has interchangeably use "tone" and "subcarrier" in a few places. Secondly, there is no definition of DC tone or DC tones prior to this sentence. Throughout the D1.0, "DC tone" or "DC tones" or DC subcarriers" have been mentioned. Not clear in the spec if we define only one DC subcarrier or mutlipe DC subcarriers. Need to define DC subcarrier(s) clearly. Ditto P339L1, P339L2. | Please refer to my comment. | REVISEDDC tone and DC subcarriers are clarified. Furthermore, guard subcarriers are also clarified.TGbe editor: Please revise the text in the paragraph of P338L49-53 and P339L1-2 in 802.11be D1.0 (P438L40-45 and P439L1-2 in 802.11be D1.2) as proposed in 11-21/1677r0. |
| 7133 | 36.3.2.1 | 338 | 51 | After "Table 36-7", add "for 80, 160 and 320 MHz respectively". (Note that Table captions in references are not included in the published version) | See comment. | REVISEDAgree with the comment with an editorial change.TGbe editor: Please revise the text in the paragraph of P338L51 in 802.11be D1.0 (P438L43 in 802.11be D1.2) as proposed in 11-21/1677r0. |
| 4790 | 36.3.2.1 | 338 | 28 | The Figure 36.4 should contain an indication of how many null subcarriers are in between small size RUs | Add a legend or text in Figure 36.4 to specify the number of null subcarriers for RUs smaller than 242. | REVISEDNull subcarriers are defined in details in subclause 36.3.2.3. Propose to add a reference subclause in the paragraph in P338L49-53 and P339L1-2 in 802.11be D1.0 (P438L40-45 and P439L1-2 in 802.11be D1.2) TGbe editor: Please revise the NOTE in P338L41-47 in 802.11be D1.0 (P438L32-39 in 802.11be D1.2) as proposed in 11-21/1677r0. |

***Discussion***

Following the definition in 802.11ax, the DC tone is defined as the subcarrier with the subcarrier index number equal to 0 (c.f., P338L53 in 802.11be D1.0). DC subcarriers shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU) are the subcarriers with zero energy, which include the DC tone and the subcarrier indices adjacent to the subcarrier index 0 as described in 36.3.2.3 (Null subcarriers).

In addition to clarification of DC subcarriers, guard subcarriers shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU) should also be clarified, which are the subcarriers with zero energy, which are located at the edge of the OFDM symbol in the frequency domain.

The number of DC subcarriers and the number of guard subcarriers are defined in 36.3.10 (Timing-related parameters).

TGbe editor: Please revise the text in the paragraph of P338L49-53 and P339L1-2 in 802.11be D1.0 (P438L40-45 and P439L1-2 in 802.11be D1.2) as follows.

The locations of the RUs are fixed as defined in Table 36-5 (Data and pilot subcarrier indices for RUs in an 80 MHz EHT PPDU), Table 36-6 (Data and pilot subcarrier indices for RUs in a 160 MHz EHT PPDU), and Table 36-7 (Data and pilot subcarrier indices for RUs in a 320 MHz EHT PPDU), (#7133)for an 80 MHz, 160 MHz, and 320 MHz EHT PPDU, respectively. In these tables, the subcarrier index of 0 corresponds to the DC tone. Negative subcarrier indices correspond to subcarriers with frequency lower than the DC tone, and positive subcarrier indices correspond to subcarriers with frequency higher than the DC tone. (#5403)DC subcarriers shown in Figure 36-4 (RU locations in an 80 MHz EHT PPDU) are the subcarriers with zero energy, which include the DC tone and the subcarrier indices adjacent to the subcarrier index 0. Guard subcarriers are the subcarriers with zero energy, which are located at the edge of the OFDM symbol in the frequency domain. The number of DC subcarriers and guard subcarriers is defined in 36.3.10 (Timing-related parameters). Null subcarriers are defined in 36.3.2.3 (Null subcarriers)(#4790).

**CID: 5404**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 5404 | 36.3.2.1 | 345 | 28 | "MRU" is used in P345L28 before definition in P345L41. | Change to "multiple resource unit (MRU)". | REJECTEDMRU is defined in clause 3 (Definitions, acronyms, and abbreviations) and used before 36.3.2.1 in 36.1.1 (Introduction to the EHT PHY)  |