IEEE P802.11  
Wireless LANs

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| CR for PICS comments on D2.0 – Part 2 | | | | |
| Date: 2018-05-04 | | | | |
| Author: | | | | |
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This submission present a resolution for CIDs 12564, 12671, 13719, 13020, and 14317. The proposed changes are based on P802.11ax D2.3.

##### Revision history:

##### R0 – initial version

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Resolution |
| 12564 | B | 565 | 21 | For an HE operation with 20 MHz only (CFHE20) the support of LDPC with more than 4 spatial streams is Mandatory and not Optional. Also 1024 QAM + LDPC mention | Change CFHE20:O to CFHE20:M | Accepted  TGax Editor: Change CFHE:M to CFHE:O in 621.21 of P802.11ax D2.3 |

***Discussion:***

The commenter suggests to replace “CFHE20:O” with “CFHE20:M” in the following PICS:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HEP10.2 | LDPC with more than 4 spatial streams |  | CFHE80:M  CFHE20:O | Yes  No  N/A  |

As per clause 28.1.1, an HE STA shall support LDPC coding (transmit and receive) in all supported HE PPDU types, RU sizes, and number of spatial streams if the STA declares support for transmitting or receiving more than 4 spatial streams.

***Proposed resolution:***

***Accepted***

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| CID | Clause | Page | Line | Comment | Proposed Change | Resolution |
| 12671 | B.4 | 557 | 13 | Many reference cells are blank | Add the missing references | Revised.  Agree in principle the references of some cells are missing.  TGax Editor: Please change the text as indicated in doc.: IEEE 802.11-18/07630. |

***Discussion:***

The commenter comments that the following reference cells are blank:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HEP6 | Tone allocation |  |  |  |
| \*HEP6.1 | 26-tone RU mapping |  | CFHE:M | Yes  No  N/A  |
| \*HEP6.2 | 52-tone RU mapping |  | CFHE:M | Yes  No  N/A  |
| \*HEP6.3 | 106-tone RU mapping |  | CFHE:M | Yes  No  N/A  |
| \*HEP6.4 | 242-tone RU mapping |  | CFHE80:M  CFHE20:O | Yes  No  N/A  |
| \*HEP6.5 | 484-tone RU mapping |  | CFHE80 and HEP3.2:M | Yes  No  N/A  |
| \*HEP6.6 | 996-tone RU mapping |  | CFHE80 and HEP3.3:M  CFHE80 and HEP3.4:M | Yes  No  N/A  |
| \*HEP6.7 | 2996-tone RU mapping |  | CFHE80 and HEP3.4:M | Yes  No  N/A  |
| HEP7 | Coding |  |  |  |
| HEP10.1 | BCC with 4 or fewer spatial streams(#12672) |  | (HEP6.1 or HEP6.2 or HEP6.3 or HEP6.4):M  (HEP3.1 and HEP2.1):M | Yes  No  N/A  |
| HEP10.2 | LDPC with more than 4 spatial streams |  | CFHE80:M  CFHE20:O | Yes  No  N/A  |
| HEP10.3 | LDPC with 4 or fewer spatial streams(#12672) |  | (HEP6.5 or HEP6.6 or HEP6.7):M  ((HEP3.2 or HEP3.3 or HEP3.4 or HEP3.5) and HEP2.1):M  (HEP6.1 or HEP6.2 or HEP6.3 or HEP6.4):O  (HEP3.1 and HEP2.1):O  CFHE20: O | Yes  No  N/A  |

***Proposed resolution:***

***Revised***

***To TGax editor: Please update the references from 620.55 to 621.42 in Annex B.4.27.2 of P802.11ax D2.3 with the proposed changes below.***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HEP6 | Tone allocation |  |  |  |
| \*HEP6.1 | 26-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE:M | Yes  No  N/A  |
| \*HEP6.2 | 52-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE:M | Yes  No  N/A  |
| \*HEP6.3 | 106-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE:M | Yes  No  N/A  |
| \*HEP6.4 | 242-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE80:M  CFHE20:O | Yes  No  N/A  |
| \*HEP6.5 | 484-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE80 and HEP3.2:M | Yes  No  N/A  |
| \*HEP6.6 | 996-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE80 and HEP3.3:M  CFHE80 and HEP3.4:M | Yes  No  N/A  |
| \*HEP6.7 | 2996-tone RU mapping | 28.3.2.2 (Resource unit, guard and DC subcarriers), 28.3.2.3 (Null subcarriers), 28.3.2.4 (Pilot subcarriers) | CFHE80 and HEP3.4:M | Yes  No  N/A  |
| HEP7 | Coding |  |  |  |
| HEP10.1 | BCC with 4 or fewer spatial streams(#12672) | 28.3.11.5.1 (Binary convolutional coding and puncturing) | (HEP6.1 or HEP6.2 or HEP6.3 or HEP6.4):M  (HEP3.1 and HEP2.1):M | Yes  No  N/A  |
| HEP10.2 | LDPC with more than 4 spatial streams | 28.3.11.5.2 (LDPC coding) | CFHE80:M  CFHE20:O | Yes  No  N/A  |
| HEP10.3 | LDPC with 4 or fewer spatial streams(#12672) | 28.3.11.5.2 (LDPC coding) | (HEP6.5 or HEP6.6 or HEP6.7):M  ((HEP3.2 or HEP3.3 or HEP3.4 or HEP3.5) and HEP2.1):M  (HEP6.1 or HEP6.2 or HEP6.3 or HEP6.4):O  (HEP3.1 and HEP2.1):O  CFHE20: O | Yes  No  N/A  |

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| CID | Clause | Page | Line | Comment | Proposed Change | Resolution |
| 13719 | B.4.4.2 | 559 | 54 | Whether any kind of frame is transmitted by an AP is up to the AP, and shouldn't be mandatory | Change to O | Accepted  TGax Editor: Change CFHE:M to CFHE:O in 615.54 of P802.11ax D2.3 |

***Discussion:***

The commenter suggests to replace “in the following PICS “FR44”:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Is reception of the following MAC frames supported? | 9 (Frame formats) |  |  |
| FR44 | Trigger frame | 9 (Frame formats) | CFHE:M | Yes  No  N/A  |

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| CID | Clause | Page | Line | Comment | Proposed Change | Resolution |
| 13020 | B.4.27.1 | 561 | 52 | Some trigger frame variants are missing in HEM5:  - GCR MU-BAR variant with section 9.3.1.23.6 as reference and CFHE:O as status  - Bandwidth Query Report Poll (BQRP) variant with section 9.3.1.23.7 as reference and CFHE:O as status  - NDP Feedback Report Poll variant with section 9.3.1.23.8 as reference and CFHE:O as status | Add missing trigger frame variants as specified in comment | Revised.  Agree in principle some trigger frame variants are missing.  TGax Editor: Please change the text as indicated in doc.: IEEE 802.11-18/0763r0. |

***Discussion:***

The comment is related to the following item “HEM5”:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HEM5 | Trigger |  |  |  |
| HEM5.1 | Basic Trigger | 9.3.1.23.1 (Basic Trigger variant) | CFHE:M | Yes  No  N/A  |
| HEM5.2 | Beamforming Report Poll | 9.3.1.23.2 (Beamforming Report Poll (BFRP) variant) | CFHE:M | Yes  No  N/A  |
| HEM5.3 | MU-BAR | 9.3.1.23.3 (MU-BAR variant) | CFHE:O | Yes  No  N/A  |
| HEM5.4 | MU-RTS transmission | 9.3.1.23.4 (MU-RTS variant) | CFHE:O | Yes  No  N/A  |
| HEM5.5 | MU-RTS reception | 9.3.1.23.4 (MU-RTS variant) | CFHE:M | Yes  No  N/A  |
| HEM5.6 | BSRP | 9.3.1.23.5 (Buffer Status Report Poll (BSRP) variant) | CFHE:O | Yes  No  N/A  |

As per Table 9-25b, the commenter is correct that the trigger frames are missing, namely GCR MU-BAR, Bandwidth Query Report Poll, and NDP Feedback Report Poll.



***Proposed resolution:***

***Revised***

***To TGax editor: Please add the following rows corresponding to HEM5.7, HEM5.8, and HEM5.9 after 618.18 in Annex B.4.27.1 of P802.11ax D2.3 with the proposed changes below.***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HEM5.7 | GCR MU-BAR | 9.3.1.23.6 (GCR MU-BAR variant) | CFHE:O | Yes  No  N/A  |
| HEM5.8 | BQRP | 9.3.1.23.7 (Bandwidth Query Report Poll (BQRP) variant) | CFHE:O | Yes  No  N/A  |
| HEM5.9 | NFRP | 9.3.1.23.8 (NDP Feedback Report Poll (NFRP) variant) | CFHE:O | Yes  No  N/A  |

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| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Resolution |
| 14317 | B.4.27.1 | 562 | 20 | According to the description of Status, SU beamformer capable is optional without any conditions. However SU beamformer is mandatory for AP which supports 4SS as described in pp263L34. Same comments on MU beamformer. | Resolve this conflict. One proposed resolution is to add 4SS capability in this table and add condition of 4SS capability in the Status of SU and MU beamformer. | Revised.  Agree in principle that there is a conflict.  TGax Editor: Please change the text as indicated in doc.: IEEE 802.11-18/0763r0. |

***Discussion:***

The commenter refer to the following two items:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| \*HEM6.1 | SU beamformer capable | 9.4.2.237 (HE Capabilities element) | CFHE:O | Yes  No  N/A  |
| \*HEM6.3 | MU beamformer capable | 9.4.2.237 (HE Capabilities element) | CFAP AND CFHEM6.1:O | Yes  No  N/A  |

As per Table 9-262aa, it is correct that U beamformer is mandatory for AP which supports 4 or more spatial streams:



The same applies for MU beamformer as per clause 27.6.2:



***Proposed resolution:***

***Revised***

***To TGax editor: Please update HEM6 and HEM 7 from 618.18 to 618.62 in Annex B.4.27.1 of P802.11ax D2.3 with the proposed changes below.***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HEM6 | Transmit beamforming |  |  |  |
| \*HEM6.1 | SU beamformer capable with fewer than 4 spatial streams | 9.4.2.237 (HE Capabilities element) | CFHE:O | Yes  No  N/A  |
| \*HEM6.2 | SU beamformer capable with 4 or more spatial streams | 9.4.2.237 (HE Capabilities element) | CFHE:M | Yes  No  N/A  |
| \*HEM6.3 | SU beamformee capable | 9.4.2.237 (HE Capabilities element) | CFHE:O | Yes  No  N/A  |
| \*HEM6.4 | MU beamformer capable with fewer than 4 spatial streams | 9.4.2.237 (HE Capabilities element) | CFAP AND CFHEM6.1:O | Yes  No  N/A  |
| \*HEM6.5 | MU beamformer capable with 4 or more spatial streams | 9.4.2.237 (HE Capabilities element) | CFAP AND CFHEM6.2:M | Yes  No  N/A  |
| \*HEM6.6 | MU beamformee capable | 9.4.2.237 (HE Capabilities element) | CFIndepSTA and VHTM7.2: O | Yes  No  N/A  |
| \*HEM6.7 | Transmission of HE NDP | 27.6 (HE sounding protocol) | HEM6.1:M  HEM6.2:M | Yes  No  N/A  |
| \*HEM6.8 | Reception of HE NDP | 27.6 (HE sounding protocol) | HEM6.3:M | Yes  No  N/A  |
| \*HEM6.9 | Transmission of Trigger frame | 27.6 (HE sounding protocol) | HEM6.1:O  HEM6.2:O | Yes  No  N/A  |
| HEM6.10 | Reception of Trigger frame | 27.6 (HE sounding protocol) | HEM6.9:M | Yes  No  N/A  |
| HEM7 | Sounding protocol |  |  |  |
| HEM7.1 | HE Sounding Protocol as SU beamformer | 27.6 (HE sounding protocol) | HEM6.1:M  HEM6.2:M | Yes  No  N/A  |
| HEM7.2 | HE Sounding Protocol as SU beamformee | 27.6 (HE sounding protocol) | HEM6.3:M | Yes  No  N/A  |
| HEM7.3 | HE Sounding Protocol as MU beamformer | 27.6 (HE sounding protocol) | HEM6.4:M(#13502),  HEM6.5:M | Yes  No  N/A  |
| HEM7.4 | HE Sounding Protocol as MU beamformee | 27.6 (HE sounding protocol) | HEM6.6:M(#13503) | Yes  No  N/A  |