IEEE P802.11
Wireless LANs

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| CR for CID 22030, 22031, 22032, 22447 |
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Abstract

This submission proposes text changes of TGax Draft 5.0 for CID 22030, 22031, 22032, 22447

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: add more clarification text.
* Rev 4: updated resolution for CID 22031

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

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **P/L** | **Comment** | **Proposed change** | **Resolution** |
| 22030 | 27.3.7 | 529/53 | Term "HE-MCS" seems to be used ambiguously: it is the MCSs for the HE-Data field certainly, but is the MCSs for HESIGB included or not? AFAIK, P529L53 is inclusive but Table 9-321c is exclusive | Clarify that HE-MCS does not include the MCSs for HE-SIG-B (note, the MCSs for HESIGB uniquely use 52 data subcarriers, which is not a tone count used by any RU in the Data field, so this is not a trivial distinction). Perhaps invent a new term, such as HE-SIG-B-MCS, and use it at P529L53 etc. | Revised -TGax editor to make the changes shown in 11-19/1949r3 under all headings that include CID 22030. |
| 22031 | 27.3.21 | 529/16 | "... maintain PHY-CCA.indication(BUSY, channellist) primitive for the predicted duration of the transmitted PPDU derived from the LENGTH field ..." - surely this busy duration should include the too Signal Extension, yet this is precluded by the term "predicted duration of the transmitted PPDU" and certainly "the LENGTH field" does not include the Signal extension. | Use RXTIME instead (as shown in Fig 27-63?) | Reject.The RxTime derived from the LENGTH field already take the signal extension into account.Signal Extension is part of a PPDU according to the spec. e.g.:“A signal extension shall be present in a transmitted PPDU if …”“A signal extension shall be assumed to be present … in a receivedPPDU if one of the following conditions apply…” |
| 22032 | 27.3.10.7 | 552/20 | HE-SIG-B HE-MCS field refers to HE-MCS 0...5 but this is undefined since the mapping from HE-MCS to modulation, code rate, NBPSCS, NCBPS, NDBPS and data rate is traditionally defined by Section 27-5 yet that section has no entries for an "ru" with 52 data subcarriers. | Insert a new section before 27.5 titled "Parameters for HE-SIG-B-MCSs" with a suitable table. Whereever HE-MCS is used wit hreference to HE-SIG-B, change its name to HE-SIG-B-MCS | RevisedResolved in 22030. |
| 22447 | 27.3.10.8.5 | 578.61 | Line 61 states "Each HE\_SIG-B OFDM symbol shall have 52 data tones." However, there is no N\_SD=52 in the HE-MCS tables. | Please clarify how to use HE-MCS tables for the HE-SIG-B portion of the PPDU. Or, may need a separate MCS table for HE-SIG-B. | RevisedResolved in 22030. |

**Discussions for CID** 22030, 22032, 22447:

The main issue here is the HE-MCS in 11ax doesn’t have a N\_SD = 52 which is needed in HE-SIGB to determine the MCS parameters. In addition, 11ax defined HE-SIG-B HE-MCS field in HE-SIGA but later on both HE-SIG-B HE-MCS and HE-MCS are used to refer to the MCS used by HE-SIGB. Agree with the commenters to define a MCS table specificly for HE-SIGB.

**Proposed changes for CID** 22030, 22032, 22447**:**

*To the TGax Editor: add the following section after section 27.5(page 714)*

**27.5A Parameters for HE-SIG-B-MCSs**

The HE-SIG-B-MCSs, defined in table xx, is used for the HE-SIG-B transmission in the HE MU PPDU.

**Table xx HE-SIG-B MCS**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HE-SIG-B-MCS Index | DCM | Modulation | R | *NBPSCS* | *NSD* | *NCBPS* | *NDBPS* | *HE-SIG-B Rate (Mb/s)* |
| 0 | 1 | BPSK |  1/2 | 1 | 26 | 26 | 13 | 3.3 |
| 0 |  1/2 | 52 | 52 | 26 | 6.6 |
| 1 | 1 | QPSK |  1/2 | 2 | 26 | 52 | 26 | 6.6 |
| 0 |  1/2 | 52 | 104 | 52 | 13.2 |
| 2 | N/A |  3/4 | 52 | 104 | 78 | 19.5 |
| 3 | 1 | 16-QAM |  1/2 | 4 | 26 | 104 | 52 | 13.2 |
| 0 |  1/2 | 52 | 208 | 104 | 26.0 |
| 4 | 1 |  3/4 | 26 | 104 | 78 | 19.5 |
| 0 |  3/4 | 52 | 208 | 156 | 39.0 |
| 5 | N/A | 64-QAM |  2/3 | 6 | 52 | 312 | 208 | 52.0 |
| Note: The parameters*NSD, NCBPS* and*NDBPS* are used for the HE-SIG-B transmission in each 20MHz. |

*To the TGax Editor: modify the following entries in table 27-20 (page 552)*

|  |  |  |  |
| --- | --- | --- | --- |
| B1-B3 | ~~HE-SIG-BHE-MCS~~HE-SIG-B-MCS | 3 | Indicates the MCS of the HE-SIG-B field:~~Set to 0 for HE-MCS 0Set to 1 for HE-MCS 1Set to 2 for HE-MCS 2Set to 3 for HE-MCS 3Set to 4 for HE-MCS 4Set to 5 for HE-MCS 5~~Set to 0 for HE-SIG-B-MCS 0Set to 1 for HE-SIG-B-MCS 1Set to 2 for HE-SIG-B-MCS 2Set to 3 for HE-SIG-B-MCS 3Set to 4 for HE-SIG-B-MCS 4Set to 5 for HE-SIG-B-MCS 5The values 6 and 7 are reserved |
| B4 | HE-SIG-B DCM | 1 | Set to 1 indicates that the HE-SIG-B is modulated with DCM(#12751) for the MCS. Set to 0 indicates that the HE-SIG-B is not modulated with DCM(#12751) for the MCS.NOTE—DCM is only applicable to ~~MCS 0, MCS 1, MCS 3, and MCS 4~~ HE-SIG-B-MCS 0 , HE-SIG-B-MCS 1 , HE-SIG-B-MCS 3 , HE-SIG-B-MCS 4 (#12607). |
| B18-B21 | Number OfHE-SIG-BSymbols OrMU-MIMOUsers | 4 | If the HE-SIG-B Compression field is 0, indicates thenumber of OFDM symbols in the HE-SIG-B field:Set to the number of OFDM symbols in the HE-SIGB field minus 1 if the number of OFDM symbols inthe HE-SIG-B field is less than 16;Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if LongerThan 16 HE-SIG-B OFDM Symbols Support subfield of the HE Capabilities element transmitted byat least one recipient STA is 0;Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield of the HE Capabilities elementtransmitted by all the recipient STAs are 1 and if the~~HE-SIG-B HE-MCS~~ HE-SIG-B-MCS field is set to 0, 1, 2, or 3regardless of the value of the HE-SIG-B DCM field,or the ~~HE-SIG-B HE-MCS~~ HE-SIG-B-MCS field is set to 4 and theHE-SIG-B DCM field is set to 1. The exact numberof OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HESIG-B content channel, which is indicated by HESIG-B Common field in this case.If the HE-SIG-B Compression field is 1, indicates thenumber of MU-MIMO users and is set to the number ofMU-MIMO users minus 1. |

*To the TGax Editor: add the following section after section 27.3.7*

**27.3.7A HE-SIG-B modulation and coding schemes (HE-SIG-B-MCSs)**

The HE-SIG-B-MCS is a compact representation of the modulation and coding used in the HE-SIG-B field of the MU PPDU. The HE-SIG-B modulation and coding schemes is carried in the HE-SIG-B-MCS subfield of the HE-SIG-A field in MU PPDU, and indicates an HE-SIG-B-MCS in the range 0 to 5.

*To the TGax Editor: modify the following paragraphs in page 529.53*

**27.3.7 HE modulation and coding schemes (HE-MCSs)**

The HE-MCS is a compact representation of the modulation and coding used in the ~~HE-SIG-B and~~ Data
fields of the PPDU. For an HE SU PPDU and an HE ER SU PPDU it is carried in the HE-SIG-A field. For
an HE MU PPDU it is carried per user in the User Specific field of the HE-SIG-B field. For an HE TB
PPDU, it is carried in the User Info field of the Trigger frame soliciting the HE TB PPDU.

~~The modulation and coding used in the HE-SIG-B field of an HE MU PPDU is carried in the HE-SIG-B
MCS subfield of the HE-SIG-A field, and indicates an HE-MCS in the range 0 to 5.~~

*To the TGax Editor: modify the following paragraphs in page 530.18*

DCM is an optional modulation scheme used for the HE-SIG-B field and the Data field in an HE PPDU. The
use of DCM for the HE-SIG-B field in an HE MU PPDU is indicated in the HE-SIG-A field. For the HE-SIG-B field, DCM is applicable to only the HE-SIG-B-MCSs 0, 1, 3 and 4. The use of DCM on the Data field of an HE SU PPDU and HE ER SU PPDU is indicated in the HE-SIG-A field. The use of DCM in the Data field of an HE MU PPDU is indicated in the HE-SIG-B field. For the Data field, DCM is applicable to only the HE-MCSs 0, 1, 3 and 4.

*To the TGax Editor: modify the following paragraphs in page 578.53*

If the coding rate of the ~~HE-SIG-B HE-MCS~~ HE-SIG-B-MCS is not equal to 1/2, the convolutional encoder output bits for each field are concatenated, then the concatenated bit streams are punctured as described in 17.3.5.6 (Convolutional encoder).

*To the TGax Editor: modify the following paragraphs in page 578.58*

The coded bits are interleaved as in 27.3.11.8 (BCC interleavers). The interleaved bits are mapped to constellation points from the ~~HE-MCS~~ HE-SIG-B-MCS specified in HE-SIG-A and have pilots inserted following the steps described in 17.3.5.8 (Subcarrier modulation mapping) and 17.3.5.9 (Pilot subcarriers), respectively. Each HE-SIG-B OFDM symbol shall have 52 data tones.

*To the TGax Editor: modify the following paragraphs in page 579.28*

** is the phase rotation value for HE-SIG-B field PAPR reduction. When the HE-SIG-B field is modulated with HE-SIG-B-MCS ~~MCS~~=0 and DCM=1,

*To the TGax Editor: modify the following paragraphs in page 624.27*

DCM modulates the same information on a pair of sub-carriers. DCM is an optional modulation scheme for
the HE-SIG-B and Data fields. DCM is applicable to only HE-MCSs and ~~HE-SIG-B HE-MCSs~~ HE-SIG-B-MCSs with indices 0, 1, 3 and 4.

*To the TGax Editor: replace the highlighte**in the equation below with* .



*To the TGax Editor: remove the sentence below in P578.41*

*~~N~~~~SR~~*~~is given in Table 21-5 (Timing-related constants)~~

*To the TGax Editor: modify the following paragraphs in page 566.29*

A 996-tone RU is referred to by two consecutive RU Allocation subfields per HE-SIG-B content channel, for both HE-SIG-B content channels. The two consecutive RU Allocation subfields per HE-SIG-B content channel are labeled the first RU Allocation subfield and the second RU Allocation subfield. A 484-tone RU is referred to by a single RU Allocation subfield per HE-SIG-B content channel, for both HE-SIG-B content channels. Smaller RUs are referred to by a single RU Allocation subfield in a single HE-SIG-B content channel. If a Common field is present in a 160 MHz or 80+80 MHz PPDU, a 2×996 tone RU is not permitted (none are defined in Table 27-26 (RU Allocation subfield)).

For an RU that is referred to by a ~~the~~ first or only RU Allocation subfield in an HE-SIG-B content channel ~~that refers to an RU~~, the RUAllocation subfield encodes the number of User fields per RU contributed to the User Specific field in the
same HE-SIG-B content channel as the RU Allocation subfield. This number is labeled *Nuser*(*r*, *c*) for RU *r*and HE-SIG-B content channel *c* as described in Table 27-26 (RU Allocation subfield).

For an RU that is referred to by two RU Allocation subfields in an HE-SIG-B content channel (i.e. an RU of size equal to 996 tones in a 160/80+80 MHz PPDU), the second RU Allocation subfield, ~~if present,~~ in ~~an~~ the HE-SIG-B content channel ~~that refers to an RU of size equal to 996-tone, the RU Allocation subfield~~ encodes zero additional User fields per RU contributed to the User Specific field in the same HE-SIG-B content channel as the RU Allocation subfield.