IEEE P802.11  
Wireless LANs

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | PHY Comment Resolution | | | | | | Date: 2018-01-17 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Ron Porat | Broadcom |  |  | [Ron.porat@broadcom.com](mailto:Ron.porat@broadcom.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes resolutions for comments:

11496, 11530, 11636, 11695, 11719, 11864, 12578, 12639, 12640, 12709, 12801, 12802, 13371, 13407, 11531, 11532, 13239, 13305, 13460, 13461, 13462, 13601, ~~14072~~, 13713, 14080, 13638

From the letter ballot of TGax D2.0.

Changes relative to D2.0.

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 11496 | Chunyu Hu | 28.3.10.8.6 | 432.32 | There is no definition of load balancing before usage. Load balancing is a general term in network, but is complete new in this new context of HE SIG-B. It's not clear what it means in this section. Please define it before using it in the text of behavior description. | as in the comment | Revised  Editor please make changes shown in document 11-18-0118 under comment 11496 |
| 11530 | Dorothy Stanley | 28.3.10.8.5 | 426.48 | something is weird with the formatting. Its seems like "Use the same value in both HE-SIG-B content channels." should be part of the 80 MHz description, but its looks like its in the paragraph with the 160 MHz section. Please clarify. | as in comment | Revised.  Editor: remove the gap above that sentence and add a gap below it. Also change that sentence as follows:  ~~Use~~ The same value is applied to ~~in~~ both HE-SIG-B content channels |
| 11636 | Dorothy Stanley | 28.3.10.7.2 | 405.25 | The title of Table 28-18 is "HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU", so why would B0 of HE-SIG-A1 ever be "set to 0 for HE TB PPDU"? You probably just want to say "set to 1 for HE SU PPDU and HE ER SU PPDU", and not say anything about HE TB PPDU. | as in comment | Revised.  Editor please make changes shown in document 11-18-0118 under comment 11636 |
| 11695 | Erik Lindskog | 28.1.1 | 328.01 | We are here referring to the regulatory requirements of VHT. | Add a separate section for regulatory requirements under Clause 28. | Rejected:  No need to repeat the same text twice |
| 11719 | Fei Tong | 28.1.1 | 376.65 | Option support for Mid-amble should be included in the list HE STA may support | Add mid-amble to the optional support list | Revised  Editor: Refer to the resolution of CID 13622 in 37r1 |
| 11864 | Guoqing Li | 28.1.4 | 331.60 | Support of HE MU PPDU is mandatory in DL, but optional in UL. Please clarify. | Clarify | Revised  Editor please add at the end of line 61 the following: for transmission for AP and reception for Non-AP STA |
| 12578 | Mark RISON | 28.1.1 | 329.20 | It is not clear that HE APs shall support (at least) 2SS | At the end of the list "An HE AP shall support the following features:" add "Transmission and reception of PPDUs with two spatial streams" | Rejected:  There are mobile AP that don’t need to support 2SS.  That decision is best left to WFA |
| 12639 | Mark RISON | 28.3.10.8.6 | 432.31 | "In the case of load balancing for RUs of size greater than 242 subcarriers where user fields corresponding to the same MU-MIMO allocations are split into two HE-SIG-B content channels, the user-field positions are logically continuous with the first user field corresponding to the same RU in the second HE-SIG-B content channel updating its position (and therefore, column index) from that of the last user field in the first HE-SIG-B content channel." is not clear. What is load balancing for RUs (there are only two occurrences of the term, the other being very similar)? How are "user fields corresponding to the same MU-MIMO allocations [...] split into two HE-SIG-B content channels"? What "column index" is being referred to here (this is the only occurrence of the term)? | Delete the cited text | Revised.  Editor please make changes shown in document 11-18-0118 under comment 12639 |
| 12640 | Mark RISON | 28.3.10.8.5 | 429.08 | "In the case of load balancing for RUs of size greater than 242-tone RU, y2y1y0 = 000-111 indicates number of User fields in the HE-SIG-B content channel that contains the corresponding 8-bit RU Allocation subfield. Otherwise, y2y1y0 = 000-111 indicates number of STAs multiplexed in the 106-tone RU, 242-tone RU or the lower frequency 106-tone RU if there are two 106-tone RUs and one 26-tone RU is assigned between two 106-tone RUs. The binary vector y2y1y0 indicates 22 x y2 + 21 x y1 + y0 + 1 STAs multiplexed the RU." is not clear. What is load balancing for RUs (there are only two occurrences of the term, the other being very similar)? | Delete the cited text | Revised  Editor please make the following change in 429.08:  ~~In the case of load balancing for~~ When signaling RUs of size greater than 242-tone ~~RU~~ |
| 12709 | Mark RISON | 28.3.10.8.5 | 427.17 | Table 28-24 specifies the spatial configuration per each number of users. This configuration is monotonic decreasing, maximum number of spatial streams per user is 4 and maximum total number of spatial streams is 8. This table covers all the cases that are possible except the following case: Number of users: 5 Spatial configuration: 2 2 2 1 1 There is no clear reason why this case should not be included, as it fulfils all the requirements, and it is the only case out of all possible combinations that is not included in that table. | Add the 2 2 2 1 1 configuration (from the reserved values) | Rejected.  The comment was already adressed |
| 12801 | Mark RISON | 28.3.10.7.1 | 408.09 | No behaviour is associated with the "TxBF" field in HE-SIG-A | Make this field reserved | Rejected  This field enables the receiver to make decisions about smoothing |
| 12802 | Mark RISON | 28.3.10.8.6 | 431.08 | No behaviour is associated with the "Tx Beamforming" field in HE-SIG-B | Make this field reserved | Rejected  This field enables the receiver to make decisions about smoothing |
| 13371 | ron porat | 28.3.10.8.5 | 428.00 | To cover certain legal allocation in 80, 160 or 80+80 OFDMA cases when for a particular HE-SIG-B content channel, one 996-tone RU Allocation subfield has non-zero number of users while the other 996-tone RU allocation subfiled has no users, change to "996-tone RU with no User fields indicated by this RU Allocation subfield". | Revise as suggested | Revised  Editor: See resolution for comment 13407 |
| 13407 | Rui Cao | 28.3.10.8.3 | 424.04 | When RU=996 is allocated, the setting of the RU Allocation Bits is not clearly defined. The totally number of users in one 996RU will be split in two content channels with load balancing. However, each 996RU will have 16 bit RU Allocation bits, and 8-bit RU Allocation 11010yyy can already clearly specify the number of users signaled in the corresponding content channel. How to set the second 8 bits is not specified in current text. | Propose to add the following to the paragraph, "If RU equals 996, the first 8 RU Allocation bits will use entry 11010yyy as in Table 28-24 with yyy indicating the number of users signaled in the corresponding content channel, while the second 8 RU Allocation bits will be set to 01110011". In addition, change the description of entry "01110011" in Table 28-24 to "996-tone RU with zero User indicated in this RU Allocation subfield of the HE-SIG-B content channel". | Revised:  Editor please make changes shown in document 11-18-0118 under comment 13407 |
| 14080 | Youhan Kim | 28.3.10.8.3 | 424.54 | Consider a 996-tones RU. There are four RU Allocation tables in which one or more User field(s) could be signalled, with two RU Allocation tables in a given HE-SIG-B content channel. But within a given HE-SIG-B content channel, there is no benefit in signaling non-zero User fields in the RU Allocation table which is not the first one in the HE-SIG-B content channel (e.g. there is no saving in the number of User fields). Similar example holds for RU2x996. | Add rule indicating that in case of 996-tone or 2x996-tone RUs, only the first RU Allocation table in each HE-SIG-B content channel may have non-zero users. Subsequent RU Allocation tables in each HE-SIG-B content channel shall indicate zero users. | Revised  Editor: see resolution to comment 13407 |
| 13638 | Tianyu Wu | 28.3.10.8.3 | 424.04 | Signaling of 996 tone RU in 160/80+80 Mhz PPDU need to be clarified. | Add a paragraph clarifying the 996 tone RU signaling. There will be 4 RU allocation subfields in total, each HE SIG B content channel carries 2 RU allocation subfields. | Revised  Editor: see resolution to comment 13407 |
| 11531 | Dorothy Stanley | 28.3.10.8.5 | 428.01 | What does "Number of entries" mean for cases that are "Reserved" in Table 28-24? | as in comment | Rejected:  It simply means the number of reserved entries |
| 11532 | Dorothy Stanley | 28.3.10.8.5 | 428.41 | Table 28-24, Regarding "10y2y1y0z2z1z0", how do you multiplex 64 users together in three RUs? | as in comment | Rejected:  The number 64 indicates the total combinatorial options of multiplexing up to 8 users on each 106RU using DL MU-MIMO. It is not indicating 64 users are being multiplexed |
| 13239 | Robert Stacey | 9.4.2.237.3 | 140.62 | The only difference between class A and class B devices is power control accuracy. The terminology is thus misleading not aligned with other capability naming. | Change the field name to "Tx Power/RSSI Accuracy" (or even "Power Control Accuracy") with enumerated values High and Low. Change the middle column heading in Table 28-43 to "Tx Power/RSSI Accuracy subfield" with sub-columns "High" and "Low". Updated the places where Class A and Class B are used appropriately. | Rejected  Change seems an over kill.  The proposed change may cause confusion in the text |
| 13305 | Robert Stacey | 28.3.10.7.2 | 405.40 | The description is not accurate -- see 27.11.2. Also, there is nothing in the PHY that links it to UPLINK\_FLAG. You don't need any shall statements here - they are in the MAC section. | Change the desciption so that it references TX/RXVECTOR parameter UPLINK\_FLAG. | Revised  Editor – please replace the description of that field with  “Indicates whether the PPDU is sent UL or DL as described by the TX/RXVECTOR parameter UPLINK\_FLAG” |
| 13460 | Sigurd Schelstraete | 28.3.10.7.2 | 413.10 | "Spatial Reuse field applies to the first 20 MHz subband.". Clarify "first" | See comment | Rejected:  Exact description exists below the table |
| 13461 | Sigurd Schelstraete | 28.3.10.7.2 | 413.15 | "Spatial Reuse field applies to the first 40 MHz subband.". Clarify "first" | See comment | Rejected:  Exact description below the table |
| 13462 | Sigurd Schelstraete | 28.3.10.7.2 | 417.06 | "the encoding for the Spatial Reuse 1, Spatial Reuse 2, Spatial Reuse 3 and Spatial Reuse 4 subfields for an HE SU PPDU, HE ER SU PPDU, and HE MU PPDU." These PPDU formats have only one Spatial Reuse field. | Correct | Revised:  Editor please revise as follows  ~~2, Spatial Reuse 3 and Spatial Reuse 4~~ subfield~~s~~ |
| 13601 | SUNGEUN LEE | 28.3.10.7.2 | 417.06 | Table 28-21 is SR for HE SU, HE ER SU and HE MU. HE-SIG-A for those PPDUs only have one SR field, i.e., no Spatial Reuse 1, 2, 3 and 4 | Change 'Spatial Reuse 1, Spatial Reuse 2, Spatial Reuse 3 and Spetial Reuse 4 subfiels' to 'Spatial Reuse subfield' | Accepted :  As in comment 13462 |
| ~~14072~~ | ~~Youhan Kim~~ | ~~28.3.10.7.2~~ | ~~416.45~~ | ~~What does "The Spatial Reuse fields only apply to 20 Mhz used in the transmission" mean?~~ | ~~Clarify what "The Spatial Reuse fields only apply to 20 Mhz used in the transmission" means.~~ | ~~Revised:~~  ~~Editor please delete the two instances of this sentence on lines 45 and 42 and add the following on page 417 line 4 (above the description of table 28-21):~~  ~~“Each Spatial Reuse field is applicable only if the corresponding 20MHz is occupied by at least one RU”~~ |
| 13713 | Tomoko Adachi | 9.4.2.237.4 | 145.28 | "Rx HE-MCS Map 80+80 MHz" are duplicated in Figure 9-589cm. The latter should be "Tx HE-MCS Map 80+80 MHz". | As in comment. | Accepted.  Editor please change the last field Rx to Tx |

Editor: Changes for comments 11496,12639:

*Please replace lines 21 (beginning with the word When) -37 on page 432 with the following:*

When MU-MIMO is used in RUs of size greater than 242 subcarriers, User fields corresponding to the same MU-MIMO allocations are split into two HE-SIG-B content channels and the number of users (*Nuser*) ~~in an MU-MIMO allocation~~ is computed as the sum of the number of User fields ~~per RU~~ indicated for the RU by the 8-bit RU Allocation subfield in each HE-SIG-B content channel. The User field positions are logically continuous with the first User field corresponding to the same RU in the second HE-SIG-B content channel ~~updating its position (and therefore, column index) from~~ following ~~that of~~ the last User field in the first HE-SIG-B content channel. The exact split of User fields between the two content channels is not specified.

For a given value of *Nuser*, the four bits of the Spatial Configuration field are used as follows: A STA with a STA-ID that matches the 11-bit ID signaled in the User field for an MU-MIMO allocation derives the number of spatial streams allocated to it using the row corresponding to the signaled 4-bit Spatial Configuration field and the column corresponding to the User field position in the User Specific field. The starting stream index for the STA is computed by summing the Nsts in the columns prior to the column indicated by the STA’s User field position. ~~In the case of load balancing for RUs of size greater than 242 subcarriers where User fields corre-sponding to the same MU-MIMO allocations are split into two HE-SIG-B content channels, the User field positions are logically continuous with the first User field corresponding to the same RU in the second HE-SIG-B content channel updating its position (and therefore, column index) from that of the last User field in the first HE-SIG-B content channel~~.

Editor: Changes for comments 11636:

*Please replace the definition of B0 on page 405 with the following:*

Differentiate an HE SU PPDU from an HE TB PPDU: ~~Set to 0 for HE TB PPDU~~ Set to 1 for HE SU PPDU ~~This field is reserved and set to 1 for an~~ and HE ER SU PPDU.

Please replace the definition of B0 on page 412 with the following:

Differentiate an HE SU PPDU from an HE TB PPDU:

Set to 0 for HE TB PPDU

Editor: Changes for comments 13407:

Editor please add this paragraph in 424.07:

If RU size equals 996 tones, for each HE-SIG-B content channel, the first 8-bit RU Allocation subfield used to signal that 996-tones RU may use entry 11010y2y1y0 as in Table 28-24 with y2y1y0 indicating the number of User fields signaled in the corresponding content channel, while the second 8-bit RU Allocation subfield used to signal that 996-tones RU shall be set to 01110011.

Editor change the description of entry "01110011" in Table 28-24 to "996-tone RU with ~~no~~ zero User fields indicated in ~~the HE-SIG-B content channel containing this RU Allocation subfield~~ this RU Allocation subfield of the HE-SIG-B content channel".

Editor change the description of entry "01110010" in Table 28-24 to "484-tone RU with ~~no~~ zero User fields indicated in ~~the HE-SIG-B content channel containing this RU Allocation subfield~~ this RU Allocation subfield of the HE-SIG-B content channel".