IEEE P802.11
Wireless LANs

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| D2.0 Comment Resolution –Clause 22.3.8.2.6 |
| Date: May 15th 2012 |
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Abstract

This document provides resolutions for CID 4570, 4703, 4701, 4702, 5479, 4264.

Revision 1 provides a revised resolution to CID 4264.

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 4570 | 215.23 | 22.3.8.2.6 | The maximum useful pre-EOF pad PSDU size is 1048575 octets, you can't need more than 19 bits to represent this | In the next to the last column of Table 22-13, change the Length field to read "B0-B18 (19)" and the Reserved field to read "B19-B22 (4)" | REJECT.The commenters suggested reduce the bit size of VHT-SIG-B length representation for SU 80/80+80/160. But, when a similar comment was submitted in D0.1 comments resolution stage, TGac has already agreed that the current text is still valid even if it might be excessive a little for a case, because bigger PHY layer maximal PSDU length makes future extention easier. See 11/0609r5 (Liwen’s).Therefore, VHT-SIG-B length 21 bit is still necessary from the above reasonings.See 12/0337r0. |
| 4703 | 215.23 | 22.3.8.2.6 | Since the maximum useful pre-EOF pad PSDU size is 2\*\*20-1 octets, you can't need more than 19 bits to represent this | In the penultimate column of Table 22-13, change the Length field to read "B0-B18 (19)" and the Reserved field to read "B19-B22 (4)" | REJECT.The commenters suggested reduce the bit size of VHT-SIG-B length representation for SU 80/80+80/160. But, when a similar comment was submitted in D0.1 comments resolution stage, TGac has already agreed that the current text is still valid even if it might be excessive a little for a case, because bigger PHY layer maximal PSDU length makes future extention easier. See 11/0609r5 (Liwen’s).Therefore, VHT-SIG-B length 21 bit is still necessary from the above reasonings.See 12/0337r0. |
| <Discussion>**On whether need to reduce the VHT-SIG-B bit size for SU 80/80+80/160 or not**The commenters suggested reduce the bit size of VHT-SIG-B length representation for SU 80/80+80/160. But, I think the current text is still valid even if it might be excessive a little for a case, because bigger PHY layer maximal PSDU length makes future extention easier, which TGac has already agreed (FYI) when a similar comment was submitted in D0.1 comments resolution stage. See 11/0609r5 (Liwen’s).Therefore, VHT-SIG-B length 21 bit is still necessary from the above reasonings. **TGac editor: No change** |
| 4701 | 215.25 | 22.3.8.2.6 | What is the purpose of the VHT-SIG-B Length?For SU PPDUs, the length can be derived from the L-SIG LengthFor MU PPDUs, the PPDU length can be derived from the L-SIG Length and the A-MPDU pre-EOF padding length can be derived, if it is wished to save power, by looking at the EOF bit in delimiters | Delete the VHT-SIG-B from SU PPDUs, and delete the Length from MU VHT-SIG-Bs | REJECT.VHT-SIG-B Length is one of precious informations for VHT transmission by which per-user length value and MCS value per each user during MU transmissions can be obtained. From APEP\_LENGTH parameter in the TXVECTOR, VHT-SIG-B sets its Length value with the use of Equation (22-42), which can be efficiently used for instantaneous power saving just at PHY level without any additional information exchange with MAC layer.See 12/0337r0. |
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| 4702 | 215.41 | 22.3.8.2.6 | The 40 MHz MU VHT-SIG-B Length field size does not allow a PPDU duration of 5.46 ms | Add "except for 40 MHz MU format" before the full stop in "NOTE--Varying the VHT-SIG-B Length field size ensures that a consistent maximum PPDU duration of approximately 5.46 ms (the maximum PPDU duration from the L-SIG field) is maintained across all channel widths with both SU and MU formats." | REJECT.In general, the maximum PPDU duration is typically limited within 3ms (from L-SIG value of 2340) without RTS/CTS protection. Even if we try to extend the maximum PPDU duration upto 5.46ms using kind of RTS/CTS protection, there may be only 1 exceptional case among 311 modulation cases in total, that is, in MU-MIMO, all the 4 spatial streams are transmitted to one user with 256QAM, 5/6 code rate and short GI as well, and only in 40MHz BW. Even in that exceptional case among 311 cases, it is short by just 3% of the total PPDU duration. The current text already describes “NOTE—Varying the VHT-SIG-B Length field size ensures that a consistent maximum PPDU duration of approximately 5.46 ms (the maximum PPDU duration from the L-SIG field) is maintained across all channel widths with both SU and MU format”. So, I think there may be no meaningfulness to additionally insert an explanatory description only to explicitely mention one case.See 12/0337r0. |
| <Discussion>In general, the maximum PPDU duration is typically limited within 3ms (from L-SIG value of 2340) without RTS/CTS protection. Even if we try to extend the maximum PPDU duration upto 5.46ms using kind of RTS/CTS protection, there may be only 1 exceptional case among 311 modulation cases in total, that is, in MU-MIMO, all the 4 spatial streams are transmitted to one user with 256QAM, 5/6 code rate and short GI as well, and only in 40MHz BW. Even in that exceptional case among 311 cases, it is short by just 3% of the total PPDU duration. The current text already describes “NOTE—Varying the VHT-SIG-B Length field size ensures that a consistent maximum PPDU duration of approximately 5.46 ms (the maximum PPDU duration from the L-SIG field) is maintained across all channel widths with both SU and MU format”. So, I think there may be no meaningfulness to additionally insert an explanatory description only to explicitely mention one case. **TGac editor: No change** |
| 5479 | 216.01 | 22.3.8.2.6 | According to the definition in Page 215, VHT-SIG-B bits include tail bits. However, Table 22-14 does not show that the VHT-SIG-B bits in NDP include the tail bits, and there is also no related text to mention it. | Please modify Table 22-14 or add some text to explain if the VHT-SIG-B bits in NDP include tail bits. | REVISED.See 12/0337r0. |
| <Discussion>The TAIL field shall be six bits of 0, which are required to return the convolutional encoder to thezero state. This procedure improves the error probability of the convolutional decoder, which relies on futurebits when decoding and which may be not be available past the end of the message. So, even in the VHT-SIG-B field in an NDP, 6 TAIL bits are added after the fixed bit pattern.  **TGac editor: modify the D2.1 text from P215L53, as follows****Table 22-15—VHT-SIG-B bits (before Tail field) in NDP for various channel widths** |
| 4264 | 216.46 | 22.3.8.2.6 | "as described in 22.3.10.8" is misleading since that section assumes NSS is taken from TXVECTOR, not overriden by some other section. | Need complementary changes in 22.3.10.8 - "when used for Data field interleave it this way; when used for SIGB interleave it that way" | REVISED.Exactly speaking, *Nss* can be set considering NUM\_STS and STBC parameter in the TXVECTOR together and this *Nss* value will be used for interleaving of Data field. For interleaving of L-SIG, VHT-SIG-A and VHT-SIG-B fields, *Nss* is assumed to be 1 regardless of the TXVECTOR parameter. But, it may be somewhat redundant to describe this process in clause 22.3.10.8 (BCC interleaver) again. In addition, in all the similar sub-clauses for interleaving operation in clause 18, 20 and 22 do not specify which value of *Nss* to be applied to each field in detail. So, I prefer to matchin this text to the conventional expressions.See 12/0337r0. |
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| * Frequently used parameters
 |
| Symbol | Explanation |
| *NCBPS* | Number of coded bits per symbol |
| *NCBPSS, NCBPSS,u* | Number of coded bits per symbol per spatial stream.For the VHT-SIG-B field, *NCBPSS* equals *NSD* for all users.For the Data field , *NCBPSS,u* equals the number of coded bits per symbol per spatial stream for user *u*, u = 0,…, Nu-1For the Data field in an SU PPDU, *NCBPSS = NCBPSS,0*For the Data field in an MU PPDU, *NCBPSS* is undefined |
| *NCBPSSI* | Number of coded bits per symbol per spatial stream per BCC interleaver block |
| *NDBPS, NDBPS,u* | Number of data bits per symbol for user *u*, *u =*0, 1, 2, 3.For an SU PPDU, *NDBPS = NDBPS,0*For an MU PPDU, *NDBPS* is undefined |
| *NBPSC* | Number of coded bits per subcarrier over all spatial streams |
| *NBPSCS* | Number of coded bits per subcarrier per spatial stream |
| *NRX* | Number of receive chains |
| *Nu* | For pre-VHT modulated fields, *Nu* = 1. For VHT modulated fields, *Nu* represents the number of users in the transmission (equal to the TXVECTOR parameter NUM\_USERS). |
| *NSTS*, *NSTS,u* | For pre-VHT modulated fields, NSTS,u = 1 (see NOTE 2). For VHT modulated fields, *NSTS,u* is the number of space-time streams for user *u*, u = 0,…, Nu-1.For an SU PPDU, *NSTS = NSTS,0*.For an MU PPDU, *NSTS* is undefined. |
| *NSTS,total* | For VHT modulated fields, *NSTS,total* is the total number of space-time streams in a PPDU.For pre-VHT modulated fields, *NSTS,total* is undefined.Note that *NSTS,total* = *NSTS* for SU PPDUs. |
| *NSS*, *NSS,u* | Number of spatial streams For the VHT-SIG-B field, *NSS* equals 1 for all users.For the Data field. *NSS,u* is the number of spatial streams for user *u*, u = 0,…, Nu-1.For the Data field in an SU PPDU, *NSS = NSS,0*.For the Data field in an MU PPDU, *NSS* is undefined. |
| *NTX* | Number of transmit chains |
| *NES*, *NES,u* | Number of BCC encoders For the VHT-SIG-B field, *NES* equals 1 for all users.For the Data field, *NES,u* is the number of BCC encoders for the Data field for user *u*, u = 0,…, Nu-1.For the Data field in an SU PPDU, *NES = NES,0*.For the Data field in an MU PPDU, *NES* is undefined.For the Data field encoded using LDPC, *NES* = 1 for an SU PPDU and *NES,u* = 1 for an MU PPDU for user *u*, *u =*0*, …*Nu-1(#4186) |
| *NVHTLTF* | Number of VHT long training fields (see 22.3.8.2.5 (VHT-LTF definition)) |
| *R* | Coding rate |
| NOTE 1—pre-VHT modulated fields refer to the L-STF, L-LTF, L-SIG and VHT-SIG-A fields, while VHT modulated fields refer to the VHT-STF, VHT-LTF, VHT-SIG-B and Data fieldsNOTE 2—For pre-VHT modulated fields, *u* is 0 only since Nu = 1 |

**TGac editor: modify the D2.1 text from P216L29, as follows**For each user *u*, the VHT-SIG-B field shall be BCC encoded at rate R = 1/2 as defined in 18.3.5.6 (Convolutional encoder), segment parsed as defined in 22.3.10.7 (Segment parser), interleaved as defined in 22.3.10.8 (BCC interleaver), mapped to a BPSK constellation as defined in 18.3.5.8 (Subcarrier modulation mapping), and have pilots inserted following the steps described in 22.3.10.10 (Pilot subcarriers). The VHT-SIG-B field constellation points are mapped to  space-time streams by the user-specific elements of the first column of the  matrix which is defined in clause 22.3.8.2.5 (VHT-LTF definition). The total number of data subcarriers and pilot subcarriers are the same as in the Data field. The space-time streams per each frequency segment are input into the CSD block which is defined in Table 22-11 (Cyclic shift values for the VHT modulated fields of a PPDU(#5157)) and follow the same transmission flow as the Data field from there on. The 800 ns guard interval is always applied to the VHT-SIG-B symbol, regardless of the value of the Short GI field in VHT-SIG-A. The time domain waveform for the VHT-SIG-B field in a VHT PPDU(#4734) shall as specified in Equation (22-43). |