IEEE P802.11
Wireless LANs

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| CC50 CR for UHR-SIG User Specific Field – Part 1 |
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Abstract

This submission contains the proposed comment resolutions of CIDs in 25/0296 IEEE 802.11bn CC50 comments on D0.1.

27 comments (26 CIDs) for subclause 38.3.15.9.6 (User Specific field) are resolved.

Resolved CID: **327, 52, 1976, 1977, 1978, 2775, 3536, 36, 116, 130, 1166, 1062, 1352, 2070, 2776, 3308, 3537, 328, 329, 376, 1091, 1167, 1589, 2290, 2291, 3309, and 3501.**

In addition, **Motion 305** and **Motion 315** are included.

Revision Notes

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| R0 | Initial revision |
| R1 | Update the text related Motions 305 and 315 |
| R2 | Add CID 2291 |

## 1 CID related to the general description of User Specific field

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| 327 | 172.01 | 38.3.15.9.6 | The section 38.3.15.9.6 User Specific field may need some minimal introduction. | See comment | REVISED.More descrptions are added to the User Specific field.***Instructions to the editor:*** **Please make the changes as shown under CID 327 in 11-25/0725r2.** |

***Instructions to the editor: please insert the following paragraphs to Page 182, Line 2 in the subclause 38.3.15.9.6 (User Specific field) in D0.2 as shown below:***

The text in 802.11bn D0.2:

The User Specific field of a UHR-SIG content channel consists of zero or more user encoding blocks followed by padding (if present). The figures of User Specific field described in EHT-SIG also apply to UHR-SIG (See 36.3.12.8.2 (EHT-SIG content channels)). Note that there is no UHR sounding NDP. For a UHR MU PPDU, each UHR-SIG content channel consists of a Common field followed by a User Specific field.

For a DL OFDMA transmission (in the U-SIG field, the UL/DL field is set to 0, the PPDU Type And Compression Mode field is set to 0, and the Co-BF/Co-SR Indication field is set to 1), the number of user fields is indicated by the RU Allocation subfields. Each nonfinal user encoding block is made up of two user fields that contain information for two STAs that are used to decode their payloads. The final user encoding block contains information for one or two users depending on the number of User fields in the UHR-SIG content channel.

For a UHR SU transmission (in the U-SIG field, the UL/DL field is set to either 0 or 1, the PPDU Type And Compression Mode field is set to 1, and the Co-BF/Co-SR Indication field is set to 1), a DL SU Co-SR transmission (in the U-SIG field, the UL/DL field is set to 0, the PPDU Type And Compression Mode field is set to 1, and the Co-BF/Co-SR Indication field is set to 0), a DL non-OFDMA Co-BF transmission (in the U-SIG field, the UL/DL field is set to 0, the PPDU Type And Compression Mode field is set to 2, and the Co-BF/Co-SR Indication field is set to 0), and a DL non-OFDMA MU-MIMO transmission (in the U-SIG field, the UL/DL field is set to 0, the PPDU Type And Compression Mode field is set to 2, and the Co-BF/Co-SR Indication field is set to 1), the number of user fields is indicated by the Number Of Non-OFDMA Users subfield. The Common field of the UHR-SIG content channel is encoded together with the first User field in the same content channel. This common encoding block contains a CRC and a Tail.

The content of the common encoding block in the UHR-SIG field for a UHR SU transmission, DL SU Co-SR transmission, DL non-OFDMA MU-MIMO transmission, and DL non-OFDMA Co-BF transmission is defined in Table 38-26 (The common encoding block in a UHR-SIG field for a UHR SU transmission, DL SU Co-SR transmission, DL non-OFDMA MU-MIMO transmission, and DL non-OFDMA Co-BF transmission). In the case of a DL non-OFDMA MU-MIMO transmission or DL non-OFDMA Co-BF transmission, the remaining user fields (if present) in each content channel are grouped into user encoding blocks using the same method as the OFDMA transmission.

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| * The common encoding block in a UHR-SIG field for a UHR SU transmission, DL SU Co-SR transmission, DL non-OFDMA MU-MIMO transmission, and DL non-OFDMA Co-BF transmission
 |
| Bit | Subfield | Number of bits per subfield | Description |
| B0–B18 | Common field for a UHR SU transmission, DL SU Co-SR transmission, DL non-OFDMA MU-MIMO transmission, and DL non-OFDMA Co-BF transmission | 19 | The Common field for a UHR SU transmission, DL SU Co-SR transmission, DL non-OFDMA MU-MIMO transmission, and DL non-OFDMA Co-BF transmission is defined in Table38-25 (Common field fora UHR SU transmission, DL SU Co-SR transmission, DL non-OFDMA MU-MIMO transmission, and DL non-OFDMA Co-BF transmission).  |
| B19–B41 | User field | 23 | The User field format for a non-MU-MIMO allocation is defined in Table38-28 (User field format for a non-MU-MIMO allocation). The User field format for an MU-MIMO allocation is defined in Table38-30 (User field format for an MU-MIMO allocation). |
| B42–B45 | CRC | 4 | The CRC is calculated over bits 0 to 41. The CRC computation uses the same polynomial as that in 27.3.11.7.3 (CRC computation). |
| B46–B51 | Tail | 6 | Used to terminate the trellis of the convolutional decoder. Set to 0. |

The contents of the User field differ depending on whether the field addresses a user in a non-MU-MIMO allocation in an RU or a user in an MU-MIMO allocation in an RU. For a UHR SU transmission, the User field format for a non-MU-MIMO allocation is used.For a DL SU Co-SR transmission, the User field format is the same as the non-MU-MIMO User field format (See Table38-28 (User field format for a non-MU-MIMO allocation)). For a DL non-OFDMA Co-BF transmission, the User field format is the same as the MU-MIMO User field format (See Table38-30 (User field format for an MU-MIMO allocation)).

For a DL non-OFDMA Co-BF transmission, regarding the ordering of User fields, if the largest number of spatial streams of a STA in the shared BSS is larger than the number of spatial streams of any STA in the sharing BSS, the User field(s) corresponding to the shared BSS are located before the User field(s) corresponding to the sharing BSS. Otherwise, the User field(s) corresponding to the sharing BSS are located before the User field(s) corresponding to the shared BSS. The ordering of the User field(s) corresponding to the same BSS is according to the user’s number of spatial streams in non-increasing order. [#Motion 305][#Motion 315]

## 6 CIDs related to user encoding block

|  |  |  |  |  |  |
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| 52 | 173.25 | 38.3.15.9.6 | In the description of Table 38-26 for the CRC subfield, the bit number in the sentence "The CRC is calculated over bits 0 to 21 ......, and bits 0 to 43 ......" is incorrect. | Change "bits 0 to 21" to "bits 0 to 22" and change "bits 0 to 43" to "bits 0 to 45" | ACCEPTED. |
| 1976 | 173.13 | 38.3.15.9.6 | Table 38-26: missing "+" in expression "B0 - B23N-1" | "B0 - B23+N-1" | REJECTED.It is multiplication instead of addition. Thus using “+” is not correct. |
| 1977 | 173.25 | 38.3.15.9.6 | Table 38-26: missing "+" in expression "B23N - B23N+1" | "B23+N - B23+N+1" | REJECTED.It is multiplication instead of addition. Thus using “+” is not correct. |
| 1978 | 173.32 | 38.3.15.9.6 | Table 38-26: missing "+" in expression "B23N+4-B23N+9" | "B23+N+4 - B23+N+9" | REJECTED.It is multiplication instead of addition. Thus using “+” is not correct. |
| 2775 | 173.25 | 38.3.15.9.6 | In Table 38-26, change "21" to "22" (line 25) and change "43" to "45" (line 27) in describing CRC | see comments | ACCEPTED. |
| 3536 | 173.24 | 38.3.15.9.6 | typo | In Table 38-26, "The CRC is calculated over bits 0 to 21 for auser encoding block that contains one User field, and bits 0 to 43" -> The CRC is calculated over bits 0 to 22 for auser encoding block that contains one User field, and bits 0 to 45 | ACCEPTED. |

***Instructions to the editor: please insert the following paragraphs to Page 183 in the subclause 38.3.15.9.6 (User Specific field) in D0.2 as shown below:***

The text in 802.11bn D0.2:

The user encoding block is defined in Table38-27 (The user encoding block). For non-OFDMA transmission to multiple users, the user encoding block is present if there are more than one User fields in the corresponding content channel.

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| * The user encoding block
 |
| Bit | Subfield | Number of subfields | Number of bits per subfield | Description |
| B0–B23*N*-1 | User field | *N* | 23 | *N* User fields are present, where:*N*= 1 if it is the final user encoding block, and if there is only one user in the final user encoding block.*N*= 2 otherwise.The User field format for a non-MU-MIMO allocation is defined in Table38-28 (User field format for a non-MU-MIMO allocation). The User field format for an MU-MIMO allocation is defined in Table38-30 (User field format for an MU-MIMO allocation). |
| B23*N*–B23*N*+3 | CRC | 1 | 4 | The CRC is calculated over bits 0 to 22 for a user encoding block that contains one User field, and bits 0 to 45 for a user encoding block that contains two User fields. The CRC computation uses the same polynomial as that in 27.3.11.7.3 (CRC computation). (#52)(#2775)(#3536) |
| B23*N*+4–B23*N*+9 | Tail | 1 | 6 | Used to terminate the trellis of the convolutional decoder. Set to 0. |

## 20 CIDs related to the MCS subfield in the non-MU-MIMO User field

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| --- | --- | --- | --- | --- | --- |
| CID | Page.Line | Clause Number | Comment | Proposed Change | Resolution |
| 36 | 174.15 | 38.3.15.9.6 | For the MCS field, it has 5 bits not 4 bits. Change 4 to 5 in the column of Number of bits. Change "x1, x2, x3 and x4" to 17, 19, 20 and 23. Same comment to P177L41. | Refer to the comment. | REVISED.4 bits of the MCS field are changed into 5 bits. Regarding the x1, x2, x3 and x4, the corresponding MCS values are updated here, and the comment for P177L41 has been resolved in 11-25-0678.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 116 | 174.15 | 38.3.15.9.6 | Number of bits for MCS subfiled in Table 38-27 = 5, not 4. | Change to be 5 from 4. | ACCEPTED. |
| 130 | 174.15 | 38.3.15.9.6 | According to table 38-27 MCS is signaled with B11-B15 in the non-MU-MIMO user field. However, the number of bits in the table says 4 bits.Based on Motion 190 and the PDT contributions 11-24/1985 and 24/2009, i believe the number of bits in the table should be 5 instead of 4. | Change the number of bits for MCS in table 38-27 to 5 (instead of 4). | ACCEPTED. |
| 1166 | 174.15 | 38.3.15.9.6 | The number of bits for the MCS subfield is 5. Correct it. | As the comment. | ACCEPTED. |
| 1062 | 174.14 | 38.3.15.9.6 | Number of bits in MCS subfield is incorrect, must be 5 instead of 4 | In the "Table 38-27--User field format for a non-MU-MIMO allocation" the Number of bits in MCS subfield is incorrect, must be 5 instead of 4 | ACCEPTED. |
| 1352 | 174.15 | 38.3.15.9.6 | change "4" to be "5" in number of bits column | see comment | ACCEPTED. |
| 2070 | 174.15 | 38.3.15.9.6 | In the MCS subfield in Table 38-2, "Number of bits" should be 5 instead of 4. | Replace "4" with "5" | ACCEPTED. |
| 2776 | 174.14 | 38.3.15.9.6 | In Table 38-27, change "4" to "5" in the number of bits of MCS | see comments | ACCEPTED. |
| 3308 | 174.15 | 38.3.15.9.6 | Change Number of bits for MCS subfield to 5 | as in comment | ACCEPTED. |
| 3537 | 174.15 | 38.3.15.9.6 | typo | Number of bits for MCS: 4 -> 5 | ACCEPTED. |
| 328 | 174.18 | 38.3.15.9.6 | Add values for the new MCS | See comment | REVISED.x1, x2, x3 and x4 are changed into 17, 19, 20 and 23.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 329 | 174.18 | 38.3.15.9.6 | "Set to n for UHR-MCS n". Different interpretation for EQM and UEQM. Mention both. | See comment | REVISED.The meanings of the MCS field in EQM and UEQM are mentioned.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 376 | 174.19 | 38.3.15.9.6 | "x1,x2,x3,x4" should be replaced as"17,19, 20, 23" according to Motion 195 | As in comment. | ACCEPTED. |
| 1091 | 174.18 | 38.3.15.9.6 | "x1,x2...x4" can be updated by "17, 19, 20, and 13" based on passed motion | Update to "17, 19, 20, and 23" | ACCEPTED. |
| 1167 | 174.18 | 38.3.15.9.6 | based on the motion 195, x1 to x4 in Table 38-27 should be updated. | As the comment. | REVISED.x1, x2, x3 and x4 are changed into 17, 19, 20 and 23.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 1589 | 174.18 | 　 | Make the sentence complete by adding four new MCS numbers as agreed. | See the comment. | REVISED.x1, x2, x3 and x4 are changed into 17, 19, 20 and 23.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 2290 | 174.18 | 38.3.15.9.6 | Replace MCS values x1, x2, x3 and x4 with the value passed in PHY motion 195. | As in comment | REVISED.x1, x2, x3 and x4 are changed into 17, 19, 20 and 23.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 2291 | 174.26 | 38.3.15.9.6 | "STA-ID, the value of UHR-MCS 14 or UHR-MCS 15 is Validate if the condition described in 38.1.1 (Introduction to the UHR PHY) is not met.". "If the UL/DL subfield of the U-SIG field is set to 1, the value of UHR-MCS 14 or UHR-MCS 15 is Validate if the condition described in 38.1.1 (Introduction to the UHR PHY) is not met.". There is no condition described in 38.1.1 regarding UHR-MCS 14 and 15, please correct the reference. | As in comment | REJECTED.The description here is similar to the description in 802.11be. The reference still should be Subclause 38.1.1 (Introduction to the UHR PHY), although now there is no related description in Subclause 38.1.1. |
| 3309 | 174.18 | 38.3.15.9.6 | Correct the definition for UHR-MCS n. Change to n=0-15, 17, 19, 20, 23. | as in comment. Same for page 177 line 40. | REVISED.Regarding the x1, x2, x3 and x4, the corresponding MCS values are updated here, and the comment for P177L41 has been resolved in 11-25-0678.***Instructions to the editor:*** **Please make the changes as shown under CID 3501 in 11-25/0725r2.** |
| 3501 | 174.18 | 38.3.15.9.6 | Replace placeholders in Table 38-27 with new MCS values per motion 195 | Table 38-27: In the Description of MCS subfield, replace "x1, x2, x3 and x4" with "17, 19, 20 and 23" | ACCEPTED. |

***Instructions to the editor: please make the following changes to Page 184 in the subclause 38.3.15.9 (UHR-SIG) in D0.2 as shown below:***

The text in 802.11bn D0.2:

The User field format for a non-MU-MIMO allocation is defined in Table38-28 (User field format for a non-MU-MIMO allocation).

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| * User field format for a non-MU-MIMO allocation
 |
| Bit | Subfield | Number of bits | Description |
| B0–B10 | STA-ID | 11 | Set to a value of the TXVECTOR parameter STA-ID (see 37.z (TBD) (STA\_ID)). |
| B11–B15 | MCS | 5(#36)(#116)(#130)(#1166)(#1166)(#1062)(#1352)(#2070)(#2776)(#3308)(#3537) | If the STA-ID subfield is not equal to 2046, this subfield indicates the following MCS used in the spatial stream(s) of the EQM case or used in the first spatial stream of the UEQM case: (#329) Set to *n* for UHR-MCS *n*, where *n* = 0, 1, …, 15,17, 19, 20, and 23. (#376)(#1091)(#1167)(#1589)(#2290)(#3309)(#3501) Other values are Validate.Set to an arbitrary value if the STA-ID subfield is equal to 2046.If the UL/DL subfield of the U-SIG field is set to 0:If the value of STA-ID subfield matches the user’s STA-ID, the value of UHR-MCS 14 or UHR-MCS 15 is Validate if the condition described in 38.1.1 (Introduction to the UHR PHY) is not met.If the value of STA-ID subfield does not match the user’s STA-ID, all values are Disregard.If the UL/DL subfield of the U-SIG field is set to 1, the value of UHR-MCS 14 or UHR-MCS 15 is Validate if the condition described in 38.1.1 (Introduction to the UHR PHY) is not met. |

## Discussion 1 (related text in 802.11bn draft 0.2)

* User Specific field

The content of the common encoding block in the UHR-SIG field for a UHR SU transmission and non-OFDMA transmission to multiple users is defined in Table38-26 (The common encoding block in a UHR-SIG field for a UHR SU transmission and a non-OFDMA transmission to multiple users).

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| --- |
| * The common encoding block in a UHR-SIG field for a UHR SU transmission and a non-OFDMA transmission to multiple users
 |
| Bit | Subfield | Number of bits per subfield | Description |
| B0–B18 | Common field for a UHR SU transmission and non-OFDMA transmission to multiple users | 19 | The Common field for a UHR SU transmission and non-OFDMA transmission to multiple users is defined in Table38-25 (Common field for a UHR SU transmission and non-OFDMA transmission to multiple users). |
| B19–B41 | User field | 23 | The User field format for a non-MU-MIMO allocation is defined in Table38-28 (User field format for a non-MU-MIMO allocation). The User field format for an MU-MIMO allocation is defined in Table38-30 (User field format for an MU-MIMO allocation). |
| B42–B45 | CRC | 4 | The CRC is calculated over bits 0 to 41. The CRC computation uses the same polynomial as that in 27.3.11.7.3 (CRC computation). |
| B46–B51 | Tail | 6 | Used to terminate the trellis of the convolutional decoder. Set to 0. |

The user encoding block is defined in Table38-27 (The user encoding block). For non-OFDMA transmission to multiple users, the user encoding block is present if there are more than one User fields in the corresponding content channel.

|  |
| --- |
| * The user encoding block
 |
| Bit | Subfield | Number of subfields | Number of bits per subfield | Description |
| B0–B23*N*-1 | User field | *N* | 23 | *N* User fields are present, where:*N*= 1 if it is the final user encoding block, and if there is only one user in the final user encoding block.*N*= 2 otherwise.The User field format for a non-MU-MIMO allocation is defined in Table38-28 (User field format for a non-MU-MIMO allocation). The User field format for an MU-MIMO allocation is defined in Table38-30 (User field format for an MU-MIMO allocation). |
| B23*N*–B23*N*+3 | CRC | 1 | 4 | The CRC is calculated over bits 0 to 21 for a user encoding block that contains one User field, and bits 0 to 43 for a user encoding block that contains two User fields. The CRC computation uses the same polynomial as that in 27.3.11.7.3 (CRC computation).  |
| B23*N*+4–B23*N*+9 | Tail | 1 | 6 | Used to terminate the trellis of the convolutional decoder. Set to 0. |

The User field format for a non-MU-MIMO allocation is defined in Table38-28 (User field format for a non-MU-MIMO allocation).

|  |
| --- |
| * User field format for a non-MU-MIMO allocation
 |
| Bit | Subfield | Number of bits | Description |
| B0–B10 | STA-ID | 11 | Set to a value of the TXVECTOR parameter STA-ID (see 37.z (TBD) (STA\_ID)). |
| B11–B15 | MCS | 4 | If the STA-ID subfield is not equal to 2046, this subfield indicates the following modulation and coding scheme: Set to *n* for UHR-MCS *n*, where , x1, x2, x3 and x4. Other values are Validate.Set to an arbitrary value if the STA-ID subfield is equal to 2046.If the UL/DL subfield of the U-SIG field is set to 0:If the value of STA-ID subfield matches the user’s STA-ID, the value of UHR-MCS 14 or UHR-MCS 15 is Validate if the condition described in 38.1.1 (Introduction to the UHR PHY) is not met.If the value of STA-ID subfield does not match the user’s STA-ID, all values are Disregard.If the UL/DL subfield of the U-SIG field is set to 1, the value of UHR-MCS 14 or UHR-MCS 15 is Validate if the condition described in 38.1.1 (Introduction to the UHR PHY) is not met. |
| B16–B18 | NSS | 3 | If the STA-ID subfield is not equal to 2046, it indicates the number of spatial streams for up to eight spatial streams. Set to the number of spatial streams minus 1.Set to an arbitrary value if the STA-ID subfield is equal to 2046.If the UEQM subfield is equal to 1, values 0, 4-7 are Validate.If the UL/DL subfield of the U-SIG field is set to 0:If the value of STA-ID subfield does not match the user's STA-ID, all values are Disregard.* The editor takes the description in 11-24/1985r3 UEQM and new MCS PDT, which is slightly different from the description in 11-24/2009r6 PDT PHY UHR-SIG.
 |
| B19 | UEQM | 1 | If the STA-ID subfield is not equal to 2046, it indicates whether EQM or UEQM is used:Set to 0 for EQM.Set to 1 for UEQM.Set to an arbitrary value if the STA-ID subfield is equal to 2046.If the UL/DL subfield of the U-SIG field is set to 0 and if the value of STA-ID subfield does not match the user’s STA-ID, all values are Disregard.  |
| B20-B21 | Beamformed And Coding/UEQM Pattern | 2 | If the STA-ID subfield is not equal to 2046, and the UEQM subfield is equal to 0:B20 is the Beamformed subfield indicating transmit beamforming:Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation.Set to 0 otherwise.B21 is the Coding subfield indicating whether BCC or LDPC is used:Set to 0 for BCC.Set to 1 for LDPC.If the UL/DL subfield of the U-SIG field is set to 0 and if the value of STA-ID subfield does not match the user’s STA-ID, all values of B20 and B21 are Disregard.If the STA-ID subfield is not equal to 2046, and the UEQM subfield is equal to 1:LDPC is used and B20-B21 is the UEQM Pattern subfield indicating the UEQM pattern for the corresponding number of spatial streams indicated in the NSS subfield. See Table38-29 (UEQM pattern subfield encoding) for definition. Undefined values of this field are Validate or Disregard.Set to an arbitrary value if the STA-ID subfield is 2046.If the UL/DL subfield of the U-SIG field is set to 0 and if the value of STA-ID subfield does not match the user’s STA-ID, all values are Disregard. |
| B22 | 2xLDPC | 1 | If the STA-ID subfield is not equal to 2046, and either both the UEQM subfield is equal to 0 and the Coding subfield is equal to 1 or the UEQM subfield is equal to 1, this subfield indicates whether nominal LDPC codeword length of 3888 is used:Set to 0 to indicate the nominal LDPC codeword length of 648, 1296 or 1944 is used.Set to 1 to indicate the nominal LDPC codeword length of 3888 is used.If the STA-ID subfield is not equal to 2046, the UEQM subfield is equal to 0 and the Coding subfield is equal to 0, this subfield is set to 1 and treat as Validate.Set to an arbitrary value if the STA-ID subfield is 2046.If the UL/DL subfield of the U-SIG field is set to 0 and if the value of STA-ID subfield does not match the user’s STA-ID, all values are Disregard. |

Discussion 1 ends.

## Discussion 2 (SU and non-OFDMA transmission format in 802.11be)

