IEEE P802.11  
Wireless LANs

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| CID1182: Length Recovery for DMG Extended SC MCS | | | | |
| Date: 2018-7-11 | | | | |
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Abstract

This submission proposes to add an example to calculate the PSDU length at the receiver, or “Length Recovery,” when the Extended SC MCS Indication field of the PHY header of the received DMG PPDU is set to 1. The proposal is a part of the resolution of a comment from LB# 232 (REVmd Draft 1.0).

- 1 CID:

1182

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| **CID** | **Page Number** | **Line Number** | **Comment** | **Proposed Change** | **Resolution** |
| 1182 | 2864 | 13 | If the Extended SC MCS Indication field is 1, the Length field doesn't represent the actual PPDU length. It should be helpful to show how to recover the actual length at receiver to avoid potential interoperability issues. | Add a subclause (say, 20.5.3.1.5) at the last of subclause 20.5.3.1(Header), and describe an example formula/algorithm to recover the PPDU length at receiver. The text in the subclause could be informative. A separate contribution will be provided. | Revised  The editor to make the changes shown in 11-18/0898r0 under all headings that include CID 1182. |

**Discussion**

A text for an example algorithm is proposed as subclause 20.5.3.1.x below. We also propose changes for clarification as follows:

1. Clarification on the Length and Scrambler Initialization fields definition.
2. The Length field in the header doesn’t indicate the actual PSDU length in case of Extended SC MCS. Instead, the TXVECTOR parameter LENGTH should be referred during the encoding process.

**Proposed changes to D1.2:**



20.5 DMG SC mode

20.5.3 Transmission

20.5.3.1 Header

* General

*Editor: Change the text in Table 20-13 of REVmd D1.0 in subclause 20.5.3.1.1 as follows:*

|  |  |  |  |
| --- | --- | --- | --- |
| Length | 18 | 12 | If the Extended SC MCS Indication field is 0, indicates the number of data octets in the PSDU; range 1–262 143.  If the Extended SC MCS Indication field is 1, the Length field value is set to  , where *N* is the number of data octets in the PSDU in the range 1 to 262 143, and *Base\_Length1* and *Base\_Length2* are computed according to Table 20-14 (Parameters for computing Length field value in SC header when Extended SC MCS Indication field is set to 1). |

*Editor: Change the paragraph starting at P2998L41 of REVmd D1.2 in subclause 20.5.3.1.1 and add a Note after the subclause as follows:*

When the MCS belongs to the set {9.1, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6}, bits X6, X7 of the initial scrambler state are set so that X6+X7×2 = (*Base\_Length2* – *N*) mod 4, where *N* is the number of data octets in the PSDU, and *Base\_Length2* is computed according to Table 20-14 (Parameters for computing Length field value in SC header when Extended SC MCS Indication field is set to 1). Bits X1–X5 are selected in a pseudorandom fashion making sure that at least one bit in X1–X7 is nonzero.

NOTE—The combination of the values of the X6 and X7 in the Scrambler Initialization field and the Length field is unique for different PSDU lengths, i.e., there’s a one-to-one mapping between a combination (X6,X7,Length) and a PSDU length, so the receiver can recover the actual PSDU length from the header fields. See 20.5.3.1.x for an example algorithm for the length recovery.

*Editor: Add the following subclause after the last paragraph of subclause 20.5.3.1*

20.5.3.1.x Length recovery for Extended SC MCSs at receiver

This subclause describes an example steps to calculate the PSDU length *N* at the receiver when the Extended SC MCS Indication field of the received PPDU is set to 1.

1. Compute *NBLKS* using the values of the Base MCS and Length fields in the PHY header as if the Extended SC MCS Indication field is set to 0.
2. Compute *Base\_Length1* and *Base\_Length2* using *NBLKS* computed in step 1) as defined in Table 20-14.
3. Compute the PSDU length *N* using the following equation:  
   where:  
    is the value of the Length field in the PHY header  
    and are the 6th and 7th bits of the Scrambler Initialization field in the PHY header

NOTE—The equation is derived by the following equations a) to c).

1. The equation that defines the Length field value in the PHY header (see Table 20-13(DMG SC mode header fields)),  
   where:  
    is the PSDU length
2. The equation that defines the two MSBs of the Scrambler Initialization field, X6,X7 (see 20.5.3.1.1(General)),
3. The equations a) and b) mean that and are respectively the quotient and remainder of dividing by *4*. Thus, the following equation is obtained,  
   and the equation in step 3) of this subclause is obtained after applying simple rearrangement.

Table 20-X shows several examples of length recovery.

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| Table 20-X Examples of length recovery | | | | | | | |
| PHY header values | | | Recovered values at receiver | | | | |
| Base MCS | Length  (octets) | X6, X7 of Scramble Initialization | MCS | NBLKS | Base\_Length1  (octets) | Base\_Length2  (octets) | PSDU Length, *N* (octets) |
| 66 | 150 | 1, 0 | 9.1 | 3 | 168 | 273 | 200 |
| 7 | 95 | 1, 0 | 12.1 | 2 | 105 | 341 | 300 |
| 8 | 464 | 0, 0 | 12.2 | 6 | 504 | 1160 | 1000 |
| 9 | 403 | 0, 1 | 12.3 | 5 | 409 | 1050 | 1024 |
| 10 | 838 | 0, 1 | 12.4 | 8 | 840 | 2016 | 2006 |
| 11 | 1323 | 0, 1 | 12.5 | 10 | 1365 | 2730 | 2560 |
| 12 | 1713 | 1, 1 | 12.6 | 11 | 1764 | 3207 | 3000 |

* LDPC encoding process

*Editor: Change the text in bullet a) of subclause 20.5.3.2.3.3*

* First the total number of data pad bits *NDATA\_PAD* is calculated, using the number of LDPC codewords *NCW*:



where

*LCW* is the LDPC codeword length, which is 624 for code rate R=7/8, 672 for all other code rates

*Length* is the length of the PSDU indicated by the TXVECTOR parameter LENGTH (in octets)

 is the repetition factor (1 or 2)

*R* is the code rate

*NCWmin* is defined for BRP packets in Table 20-20 (Zero filling for DMG SC mode BRP packets).

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