IEEE P802.11
Wireless LANs

|  |
| --- |
| Resolution to CID1138, 1139 and 1013 |
| Date: 2018-07-08 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Yujin Noh | Newracom |  |  | yujin.noh at newracom.com |
| Bin Tian | Qualcomm |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission shows

* The proposed changes based on 11Revmd D1.0.
* Resolution to 3 CID:
1138, 1139 and 1013 received from TGm comment collection (11Revmd D1.0)

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: discussion updated.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 1139 | 3094.36 | There is something wrong here. FORMAT = "S1G\_DUP\_1M" and "S1G\_DUP\_2M" is not mentioned here and certainly not in tables 19-1 or 21-1. I don't think there should be any reference to table 19-1 or 21-1 since an S1G STA does not transmit HT or VHT PPDUs. | Define APEP\_LENGHT for FORMAT=S1G\_DUP\_{1,2}M. It might be that it is not present but I doubt it. | Revised Agreed in principle.TGm Editor: make changes according to this document 11-18-1062-01-00m Resolution to CID1138, 1139 and 1013 |
| 1013 | 3203.17 | Given Equation (23-75), APEP\_LENGTH is used to get N\_SYM where if APEP\_LENGTH is greater than 0 in the TXVECTOR, indicates the number of octets in the A-MPDU pre-EOF padding (see 10.12.2) carried in the PSDU. However, looking at 10.12.2, there is a case that a S1G STA does not carry the A-MPDU in a PSDU. | Considering non A-MPDU carried in a PSDU, Equation (23-75) may need to be modified. Or definition of APEP\_LENGTH may be updated in TXVECTOR and RXVECTOR parameters. | RevisedAgreed in principle.TGm Editor: make changes according to this document 11-18-1062-01-00m Resolution to CID1138, 1139 and 1013 |

***Discussion***

In the current spec, APEP\_LENGTH, PSDU\_LENGTH parameters seem unclear enough which parameter should be used according to different cases. For example, APEP\_LENGTH could be used to deliver MPDU in the PSDU for non-aggregation case as of now.

**CID1013**

As a commenter described, for an S1G SU PPDU using BCC and LDPC encoding, the total number of data symbols in the Data field is given by equations including APEP\_LENGTH value as of now below.

for BCC

 for LDPC

Looking at value of APEP\_LENGTH parameter in Table 23-1, in case that APEP\_LENGTH is greater than 0 in the TXVECTOR, it indicates the number of octets in the A-MPDU pre-EOF padding (see 10.12.2) carried in the PSDU. This parameter is used to determine the number of OFDM symbols in the Data field that do not appear after a subframe with 1 in the EOF subfield for aggregation case. It seems that 11ah only supports A-MPDU format.

However, the thing is if AGGREGATION sets to NOT\_AGGREGATED, it indicates that 11ah packet does not have A-MPDU.

* MPDU (when AGGREGATION is NOT\_AGGREGATED)



* EOF padding is not conducted and the PHY directly appends padding bits to the PSDU
	+ No A-MPDU pre-EOF padding defined here.
* PSDU\_LENGTH is MPDU LENGTH
* A-MPDU (when AGGREGATION is AGGREGATED) which the current spec covers



* + An A-MPDU pre-EOF padding refers to the contents of the A-MPDU up to, but not including, the EOF Padding field.
	+ An A-MPDU subframe in EOF Padding field has 0 in the MPDU Length field and is used to pad the A-MPDU as described in 10.12.6 (A-MPDU padding for VHT PPDU or S1G PPDU(11ah)).
	+ PSDU\_LENGTH consists of APEP\_LENGTH and duration of EOF Padding (MAC padding)

Given the definition of APEP\_LENGTH as “the number of octets in A-MPDU Pre-EOF Padding” for 11ac, 11ax, 11ah and 11af globally in 11md, it would be better to keep its definition as it is in APEP\_LENGTH parameter in the Table 23-1. As a result, APEP\_LENGTH shall not be used to get *Nsym* when AGGREGATION is NON-AGGREGATED.

In order to resolve this mixed terminology issue for 11ah, propose to consider

* APEP\_LENGTH is only applied to A-MPDU corresponding texts and equations.
* PSDU\_LENGTH in TXVECTOR which is informed from MAC is used only for non-aggregation case to get Nsym in the data field.
	+ Clarify PSDU\_LENGTH parameter in terms of TXVECTOR and RXVECTOR, respectively in the table.
	+ To use PSDU\_LENGTH in TXVECTOR is limited to S1G SU PPDU since S1G MU PPDU is only allowed to support A-MPDU

***To TGm Editor:*** ***P3094L36*** *replace the current text with the proposed changes below.* *The modification should be based on the text from DCN710 approved.*

***------------- Begin Text Changes ---------------***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| APEP\_LENGTH | FORMAT is S1G | If equal to 0, indicates an S1G NDP PPDU for both RXVECTOR and TXVECTOR.If greater than 0 in the TXVECTOR, indicates the number of octets in the A-MPDU pre-EOF padding (see 10.12.2) carried in the PSDU. This parameter is used to determine the number of OFDM symbols in the Data field that do not appear after a subframe with 1 in the EOF subfield. | MU | O |
| FORMAT is S1G\_DUP\_2M or S1G\_DUP\_1M (#1139) | If equal to 0, indicates an S1G NDP PPDU for both RXVECTOR and TXVECTOR. If greater than 0 in the TXVECTOR, indicates the number of octets in the A-MPDU pre-EOF padding (see 10.12.2) carried in the PSDU. This parameter is used to determine the number of OFDM symbols in the Data field that do not appear after a subframe with 1 in the EOF subfield.  | Y | O |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ |
| PSDU\_LENGTH | FORMAT is S1G and(CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals MU | ~~Indicates the number of octets in the S1G PSDU.~~ If greater than 0 in the RXVECTOR, this parameter is the value obtained from 23.4.3 (TXTIME and PSDU\_LENGTH calculation)~~A value of 0 indicates an S1G NDP PPDU.~~ | ~~MU~~N | Y |
| Otherwise | If greater than 0 in the TXVECTOR, indicate the number of octets in the PSDU If greater than 0 in the RXVECTOR, this parameter is the value obtained from 23.4.3 (TXTIME and PSDU\_LENGTH calculation)A value of 0 indicates an S1G NDP PPDU for both RXVECTOR and TXVECTOR. | Y | Y |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates the number of octets in the S1G 2 MHz Duplicate PSDU. A value of 0 indicates an S1G NDP PPDU.~~ | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates the number of octets in the S1G 1 MHz Duplicate PSDU. A value of 0 indicates an S1G NDP PPDU.~~ | ~~Y~~ | ~~Y~~ |
| ~~Otherwise~~ | ~~(Ed)See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ |

***------------- End Text Changes ---------------***

***To TGm Editor:*** ***P1791L21*** *replace the current text with the proposed changes below.*(#1013)

**10.35.7 Transmission of an S1G NDP Sounding frame**

An S1G NDP Sounding frame shall use the 2 MHz short format as described in 23.1.4 (PPDU formats). An

S1G STA transmitting an S1G NDP Sounding frame shall use the following TXVECTOR parameters:

* APEP\_LENGTH set to 0 if the Aggregation bit in its SIG field or SIG-A field equal to 1
* PSDU\_LENGTH set to 0 if the Aggregation bit equal to 0
* NUM\_USERS set to 1
* CH\_BANDWIDTH set to the same value as the TXVECTOR parameter CH\_BANDWIDTH in the preceding S1G NDP Announcement frame
* NUM\_STS indicates two or more space-time streams
* PARTIAL\_AID ~~are~~ set as described in 10.21 (Group ID, partial AID, Uplink Indication, and COLOR in S1G PPDUs(11ah))
* NDP\_INDICATION set to 0
* RESPONSE\_INDICATION set to Long Response

***------------- End Text Changes ---------------***

***To TGm Editor:*** ***P3202L36*** *replace the current text with the proposed changes below.*(#1013)

***------------- Begin Text Changes ---------------***

For an S1G SU PPDU using BCC encoding, the total number of data symbols in the Data field, is given by Equation (23-75) if the Aggregation bit in its SIG field or SIG-A field equal to 1 or Equation (23-xx) if the Aggregation bit equal to 0.

  (23-75)

 (23-xx)

where

 is equal to 2 when STBC is used, and 1 otherwise

 and  are defined in Table 23-6 (Frequently used parameters (11ah))

 and  are defined in Table 23-4 (Timing-related constants (11ah))

 is the value of PSDU\_LENGTH parameter in TXVECTOR

For an S1G SU PPDU using LDPC encoding, the total number of data symbols in the Data field, , is given in 23.3.9.4.4 (LDPC coding).

For an S1G MU PPDU, the total number of data symbols in the Data field,, is given by

where

 is defined in Equation (23-75) with replacing , *APEP\_LENGTH,* and with , andfor BCC and in 23.3.9.4.4 (LDPC coding) for LDPC

The value of the PSDU\_LENGTH parameter returned in the PLME-TXTIME.confirm primitive for an S1G SU PPDU using BCC encoding is calculated using

*



where

 is given by Equation (23-75) or Equation (23-xx)

 and  are defined in Table 23-6 (Frequently used parameters (11ah))

 and  are defined in Table 23-4 (Timing-related constants (11ah))

The value of the PSDU\_LENGTH parameter returned in the PLME-TXTIME.confirm primitive for an S1G SU PPDU using LDPC encoding is calculated using

*



where

 is given by ~~Equation (21-62)~~ Equation (23-x2) or Equation (23-x3)

 is defined in Table 23-6 (Frequently used parameters (11ah))

 is defined in Table 23-4 (Timing-related constants (11ah))

The value of the PSDU\_LENGTH parameter for user (Ed)*u* returned in the PLME-TXTIME.confirm primitive and in the RXVECTOR for an S1G MU PPDU is calculated using

*



where

 is given by Equation (21-65)

 is  for user *u*, where  is defined in Table 23-6 (Frequently used parameters (11ah))

 is  for user *u*, where  is defined in Table 23-6 (Frequently used parameters (11ah))

 and  are defined in Table 23-4 (Timing-related constants (11ah))

The value of the PSDU\_LENGTH parameter returned in the PLME-TXTIME.confirm primitive for an NDP is 0

***------------- End Text Changes ---------------***

***To TGm Editor:*** ***P3156L32*** *replace the current text with the proposed changes below.*

***------------- Begin Text Changes ---------------***

**23.3.9.4.4 LDPC coding**

**23.3.9.4.4.1 General**

~~The LDPC operation for S1G PPDUs is the same as those specified in (Ed)21.3.10.5.4 (LDPC coding).~~

For a S1G SU PPDU using LDPC coding to encode the Data field, the LDPC code and encoding process described in 19.3.11.7 (LDPC codes) shall be used with the following modifications. First, all bits in the Data field including the scrambled SERVICE, PSDU, and pad bits are encoded. Thus, for S1G PPDUs shall be computed using Equation (23-x1) instead of Equation (19-35).

 (23-x1)

where

 is given by Equation (23-x2) if the Aggregation bit in its SIG field or SIG-A field equal to 1 or Equation (23-x3) if the Aggregation bit equal to 0.

 (23-x2)

 (23-x3)

where

 is equal to 2 when STBC is used, and 1 otherwise

 is the value of APEP\_LENGTH parameter in TXVECTOR

 is the value of PSDU\_LENGTH parameter in TXVECTOR

Following the calculation of , shall be computed using (23-x4) instead of Equation (19-36).

 (23-x4)

In addition, if computed in Equation (19-41) in step d) of 19.3.11.7.5 (LDPC PPDU encoding process) is greater than , then the LDPC Extra field of its SIG field or SIG-A field shall be set to 1. Otherwise, the LDPC Extra field of its SIG field or SIG-A field shall be set to 0.

LDPC codes used in S1G MU PPDUs shall also follow the definitions in 19.3.11.7 (LDPC codes). Refer to 23.3.9.4.5 (Encoding process for S1G MU PPDUs) for a description of the LDPC encoding process for S1G MU PPDUs.

**23.3.9.4.4.2 Padding for LDPC**

For LDPC encoding, the number of PHY padding bits for user *u*, is (Ed)calculated as



where

 is the value of the PSDU\_LENGTH parameter in TXVECTOR for user *u*

 is the initial number of symbols for the Data field when using LDPC given in 23.4.3 (TXTIME and PSDU\_LENGHT calculation) by Equation (23-77) ~~Equation (23-75)~~ for S1G SU PPDUs and Equation (23-78) ~~Equation (23-77)~~ for S1G MU PPDUs

***------------- End Text Changes ---------------***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 1138 | 3094.10 | Why is this parameter called LENGTH if it indicates a packet duration? And why does it indicate a duration in "number of symbols"? What is an "S1G PSDU"? And "S1G 2 MHz Duplicate PSDU", etc. | Change the parameter name to NUM\_SYM (or something similar) and change Value to "Indicates the number of sumbols in the PPDU" (not PSDU). FORMAT appears to be irrelavant so this could be collapsed to a single row. If this really is a length in octets then maybe the Value column should have "Indicates the number of octets in the PDSU" | RevisedTGm Editor: make changes according to this document 11-18-1062-01-00m Resolution to CID1138, 1139 and 1013 |

***Discussion***

For 11ah, the value in LENGTH field in SIG field or SIG-A field indicates the duration with 1) the number of symbols or 2) the number of octects in the PSDU (not entire PPDU) depending on whether it is aggregated case (containing A-MPDU) or non-aggregated case (containing MPDU). For example, an S1G SU PPDU using BCC encoding, APEP\_LENGTH and/or PSDU\_LENGTH in TXVECTOR parameter are given from MAC layer as below to get a value in LENGTH field, respectively.

1. The number of symbols in LENGTH field =
2. The number of octets in LENGTH field = the value given in the PSDU\_LENGTH parameter in TXVECTOR

If the row corresponding to the number of octets is removed and “Not present” condition is added as commentor reqested, it might lead to misunderstand that the value is not present. Throught the spec, the value of the LENGTH is used to construct S1G\_SHORT PPDU and S1G\_1M PPDU and operate LDPC encoding, etc.



Morever, keeping the description does not give any harm for non-aggregated case but make its meaning concrete.

In that case, to show LENGTH parameter to have both the number of symbols or octets, LENGTH is better than SYMBOL\_LENGTH as of now.

***To TGm Editor:*** ***P3094L10*** *replace the current text with the proposed changes below.* *The modification should be based on the text from DCN710 approved.*

***------------- Begin Text Changes ---------------***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LENGTH | ~~FORMAT is S1G and AGGREGATION is AGGREGATED~~  | ~~Indicates the packet duration in number of symbols in the S1G PSDU.~~  | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and AGGREGATION is AGGREGATED~~  | ~~Indicates the packet duration in number of symbols in the S1G 2 MHz Duplicate PSDU.~~  | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M and AGGREGATION is AGGREGATED~~  | ~~Indicates the packet duration in number of symbols in the S1G 1 MHz Duplicate PSDU.~~  | ~~Y~~ | ~~Y~~ |
| AGGREGATION is AGGREGATED | Indicates the packet duration in number of symbols in the PSDU (#1138) | Y | Y |
| ~~FORMAT is S1G and AGGREGATION is NOT\_AGGREGATED~~ | ~~Indicates the packet duration in number of octets in the S1G PSDU.~~  | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and AGGREGATION is NOT\_AGGREGATED~~ | ~~Indicates the packet duration in number of octets in the S1G 2 MHz Duplicate PSDU.~~  | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M and AGGREGATION is NOT\_AGGREGATED~~ | ~~Indicates the packet duration in number of octets in the S1G 1 MHz Duplicate PSDU.~~  | ~~Y~~ | ~~Y~~ |
| AGGREGATION is NOT\_AGGREGATED | Indicates the packet duration in number of octets in the PSDU(#1138) | Y | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ |

***------------- End Text Changes ---------------***