
Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
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Title	Effective utilization for packing and fragmentation subheader	
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Re:	This contribution is response to call for contribution about IEEE802.16e-D2	
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Abstract	This contribution is to propose the effective packing and fragmentation algorithm.	
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Purpose	Discuss and Adopt in the IEEE802.16e group.	
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Effective utilization for packing and fragmentation subheader

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Problem:

In 802.16REVd/D4, chapter 6 (MAC common part sublayer) says as follows.

Packing and fragmentation subheaders are mutually exclusive and shall not both be present within the same MAC PDU. When packing variable-length MAC SDUs, the MAC precedes each one with a packing subheader. Simultaneous fragmentation and packing allows efficient use of the airlink, but requires guidelines to be followed so it is clear which MAC SDU is currently in a state of fragmentation. To accomplish this, when a packing subheader is present, the fragmentation information for individual MAC SDUs or MAC SDU fragments is contained in the corresponding packing subheader. This is shown in figure 1.

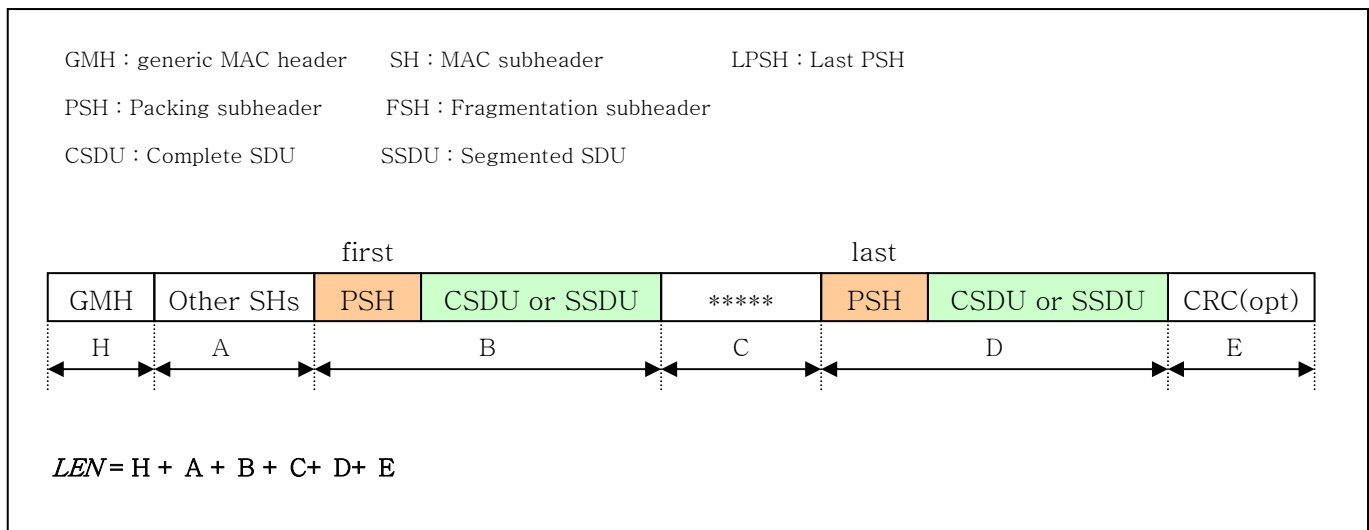


Figure 1 "Packing information within a single MAC PDU"

In figure1, all of the PSHs within a single MAC PDU contain 11bits 'length' field. This 'length' field is used for addressing individual beginning of each CSDU/SSDU within the same MAC PDU.

Problem is the 'length' field in the last PSH within a single MAC PDU. Receiver can calculate the size of the last CSDU/SSDU without the corresponding PSH's 'length' field. Therefore, when fragmentation and packing are allowed within the same MAC PDU, the last packing subheader in that MAC PDU can be replaced with an appropriate fragmentation subheader.

Change From :

The only per-SDU subheader is the Packing subheader. It may be inserted before each MAC SDU if so indicated by the Type field. **The Packing and Fragmentation subheaders are mutually exclusive and shall not both be present within the same MAC PDU.**

To :

The only per-SDU subheader is the Packing subheader. It may be inserted before each MAC SDU if so indicated by the Type field. Packing and Fragmentation subheaders may also be used in the same MAC PDU. When Fragmentation subheader and Packing subheaders are allowed within the same MAC PDU, the last packing subheader in that MAC PDU can be replaced with an appropriate fragmentation subheader.

[Page 41, Chapter 6.3.2.2.3 , line 47]

Change From :

When Packing (see 6.3.3.4) is used, the MAC may pack multiple SDUs into a single MAC PDU. When packing variable-length MAC SDUs, the MAC precedes each one with a Packing subheader. The Packing subheader is defined in Table 11.

To :

When Packing (see 6.3.3.4) is used, the MAC may pack multiple SDUs into a single MAC PDU. When packing variable-length MAC SDUs, the MAC precedes each one with a Packing subheader or a Fragmentation subheader. The Packing subheader is defined in Table 11.

[Page 108, Chapter 6.3.3.4.1.2 , line 17]

Change From :

Simultaneous fragmentation and packing allows efficient use of the airlink, but requires guidelines to be followed so it is clear which MAC SDU is currently in a state of fragmentation. To accomplish this, when a Packing subheader is present, the fragmentation information for individual MAC SDUs or MAC SDU fragments is contained in the corresponding Packing subheader.

To :

Simultaneous fragmentation and packing allows efficient use of the airlink, but requires guidelines to be followed so it is clear which MAC SDU is currently in a state of fragmentation. To accomplish this, when only Packing subheader is present, the fragmentation information for individual MAC SDUs or MAC SDU fragments is contained in the corresponding Packing subheader and when Packing subheaders and Fragmentation subheader are present simultaneously, the packing/fragmentation information for the last MAC SDU or the last segmented MAC SDU is contained in the corresponding Fragmentation subheader.