
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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Date Submitted	2004-05-10	
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Source(s)	Kang-gyu Lee Jonghyun Won, Yunsung Kim, Taein Hyon Samsung Electronic, Suwon P.O.Box 105, 416, Maetan-3dong, Paldal-gu, Suwon-si, Gyeonggi-do, Korea 442-742	Voice : +82-31-279-5337 Fax : +82-31-279-5515 yleekg@samsung.com j.h.won@samsung.com tseliot@samsung.com taein.hyon@samsung.com
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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

Kang-gyu Lee, Jonghyun Won, Yunsung Kim, Taein Hyon
 SAMSUNG ELECTRONICS

Problem:

In 802.16REVd/D4, chapter 6 (MAC common part sublayer) states 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.

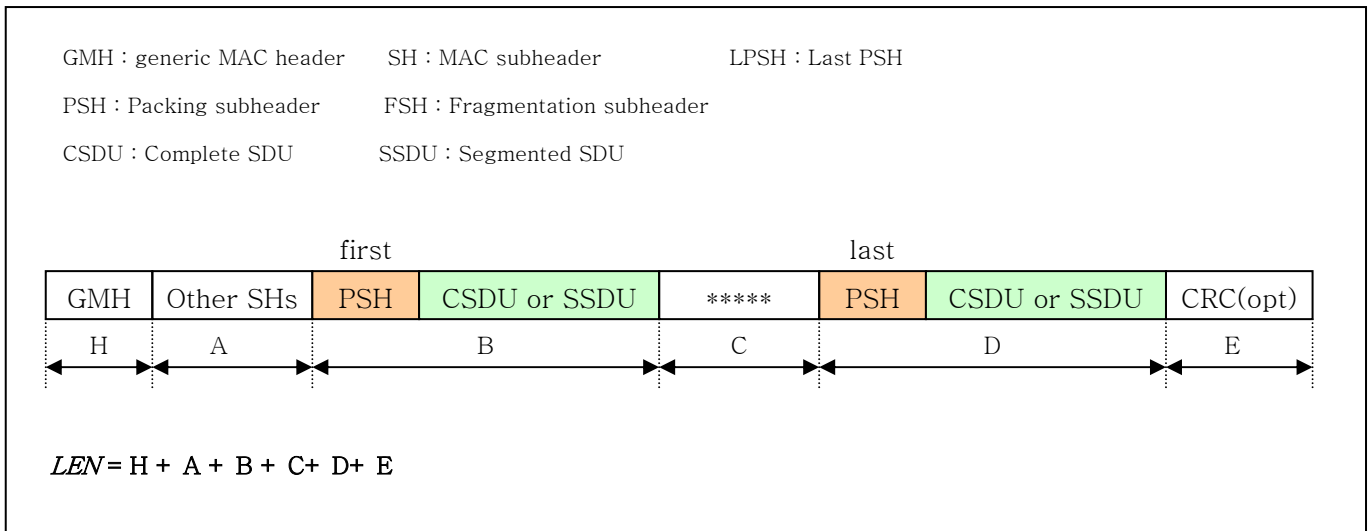


Figure 1 "Packing information within a single MAC PDU"

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.

Proposed Text Change:**[Add the following text to section4]**

4. Abbreviations and acronyms

CSDU Complete MAC SDUSSDU Segmented MAC SDU**[Add the following text to section 6.3.2.2]**

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 are allowed to be used in the same MAC PDU. When Fragmentation subheader and Packing subheaders coexist within the same MAC PDU, the last packing subheader in that MAC PDU can be replaced with an appropriate fragmentation subheader. The Packing and Fragmentation subheaders are mutually exclusive and shall not both be present within the same MAC PDU.

[Add the following text to section 6.3.2.2.3]

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. .When the Type field indicates that both packing and fragmentation coexist within a MAC PDU (i.e. Type field = "ddd11d") fragmentation subheader is used for the last piece of payload (i.e. MAC SDU or MAC SDU fragment) .

[Add the following text to section 6.3.3.4.1.2]

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. For this case, both the transmitter and receiver shall refer to table 89a.

[Add the following table 89a to section 6.3.3.4.1.2]

Table 89a "Simultaneous usage for PSHs and FSH"

<u>'FC' value of the first PSH</u>	<u>'FC' value of the successive subheader</u>
<u>00</u>	<u>00 : this is a PSH and is not for the last CSDU.</u> <u>10 : this is a FSH and is for the last SSDU.</u> <u>11 : impossible</u> <u>01 : this is a FSH and is for the last CSDU.</u>
<u>01</u>	<u>00 : this is a PSH and is not for the last CSDU.</u> <u>10 : this is a FSH and is for the last SSDU.</u> <u>11 : impossible</u> <u>01 : this is a FSH and is for the last CSDU.</u>
<u>10 = impossible</u>	<u>No meaningful</u>
<u>11= impossible</u>	<u>No meaningful</u>