
Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
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Title	Transmission of the last complete SDU without 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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Transmission of the last complete SDU without subheader

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Problem:

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

If more than one MAC SDU is packed into the MAC PDU, the type field in the MAC header indicates the presence of Packing subheaders (PSHs). Note that unfragmented MAC SDUs and MAC SDU fragments may both be present in the same MAC PDU.

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.

Now we can imagine the following situation shown in figure1. If the room of the MAC PDU is equal to 'C' ~ 'C + (PSH size - 1)', transmitter shall perform 1, 2, 3 in figure1.

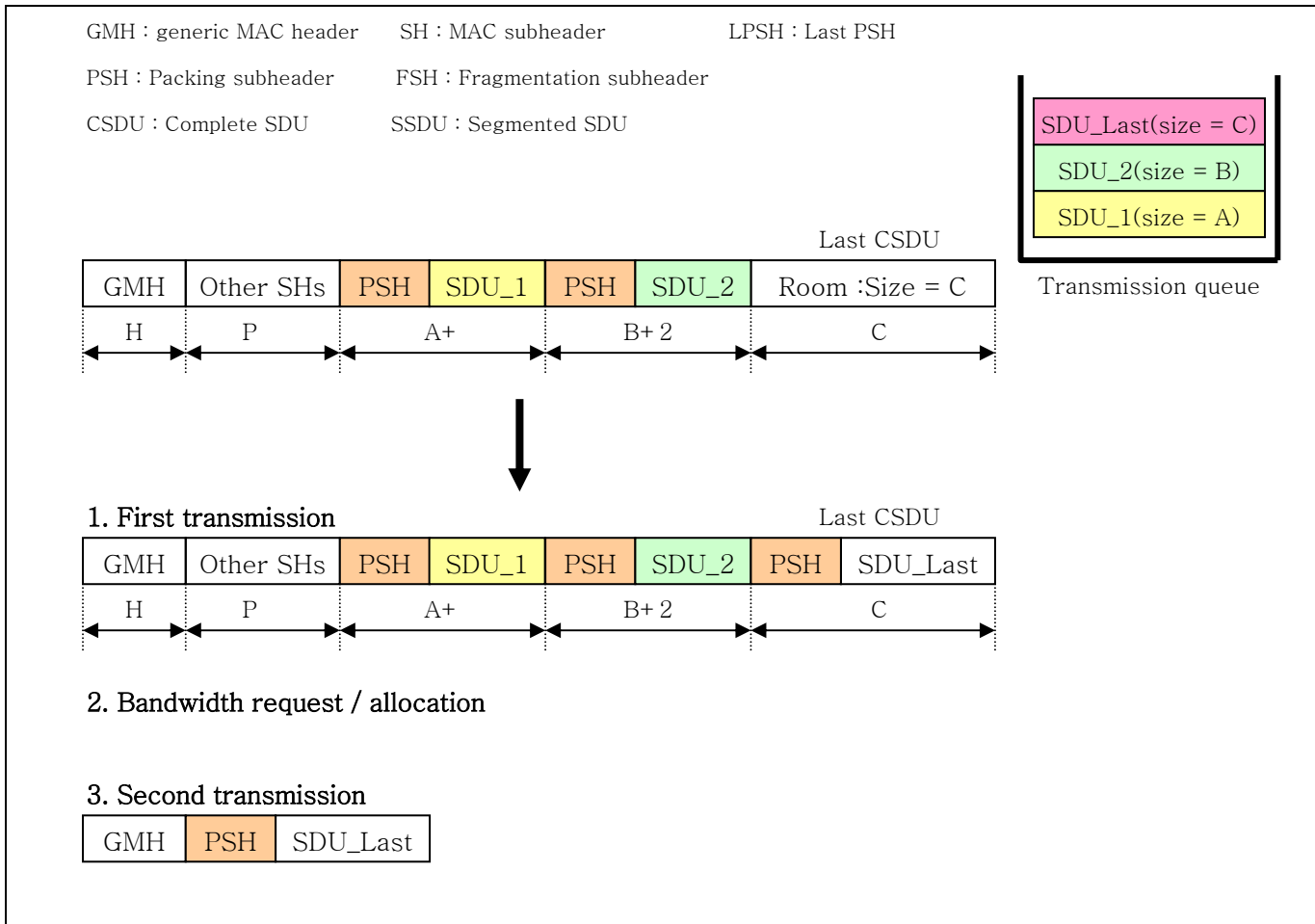


Figure 1 "insufficient room in a MAC PDU"

Remedy1:

Following table helps the transmitter to send the last complete SDU and the receiver to receive the last SDU without packing subheader.

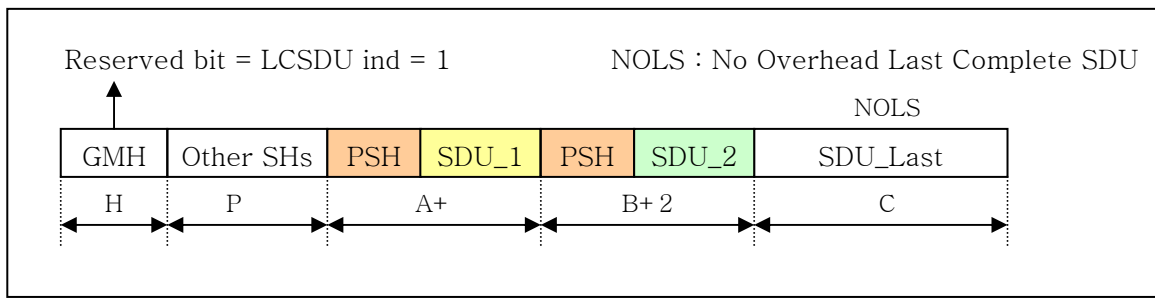


Figure 2 "SDU_Last a MAC PDU/ Without packing subheader"

The 1bit of the 2bits 'reserved' in generic MAC header can be used to indicate that the MAC PDU contains more than one packed payload and NOLS. That is to say, 1bit 'reserved' bit may be used as 'NOLS presence' bit. NOLS stands for the last complete SDU with no overhead in that MAC PDU.

When the 'C' ~ 'C + (PSH size - 1)' situation happens, transmitter sets 'NOLS presence' = LCSDU ind bit to 1 and inserts NOLS payload without PSH into the corresponding MAC PDU and receiver shall decode the 'NOLS_Presence' bit and unpack the NOLS payload from the received MAC PDU.

Important thing is 'What PSH of multiple PSHs within the corresponding MAC PDU is the last PSH followed by NOLS payload'. We can call it 'LPSH'. The solution for this problem is at FC field in PSH. When NOLS case, possible FC values of PSH in the same MAC PDU are only two cases 00 or 01. Other value 10 or 11 are impossible in this case. So we can make use of the MSB of FC field to indicate that the PSH with FC = 1x is the LPSH in the corresponding MAC PDU.

The FSH of NOLS is signaled implicitly. The FSH value for NOLS is 'FSH value in LPSH + 1'.

Table 1 "Possible FC values in NOLS case"

'FC' value of PSH	'FC' value of the successive subheader
00	This subheader is for the complete SDU and not a LPSH. So another PSH shall be occurred later within the MAC PDU.
01	This subheader is not a LPSH for the SDU segment. So another PSH shall be occurred later within the MAC PDU.
10 = impossible	This subheader is a LPSH for the complete SDU. So NOLS payload shall be occurred after the complete SDU for FC = 10.
11 = impossible	This subheader is a LPSH for segmented SDU. So NOLS payload shall be occurred after the segmented SDU for FC = 11.

Remedy2:

[Page 36, Table 4, line 16 or 21]

Change From :

Reserved <-- set to 0

To :

NOLS bit <-- can be set to 0 or 1