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Title	ARQ Changes for 802.16abc-01/01r1	
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Source(s)	Vladimir Yanover Alvarion Ltd. 21 A Habarzel St. Ramat - Hahayal Tel - Aviv 69710 P.O. Box 13139, Tel-Aviv 61131, Israel	Voice: +972-36457834 Fax: +972-36456222 mailto:vladimiry@breezecom.co.il
Re:	Update for the ARQ text initially published in 802.16abc-01/01	
Abstract	This document contains fragments of text and pictures intended to fix the comments resolution at the IEEE 802.16 Session #14	
Purpose	This document is contributed to describe details of certain comment submitted in response to th Call for Comments IEEE 802.16ab-01/06r1	
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ARQ Changes for 802.16abc-01/01r1

Vladimir Yanover

Alvarion Ltd., Israel

This document contains fragments of text and pictures intended to fix the comments resolution at the IEEE 802.16 Session #14. Section numbers refer to 802.16abc-01/01r1 (where ARQ section was omitted by mistake).

The following section 6.3.4.1 should be placed after the title 6.2.4 ARQ - 2-11 GHz Bands Only of the 01/01r1 document.

6.3.4.1 Block Numbering Based Retransmission Scheme

6.2.4.1.1 ARQ Blocks

An **ARQ Block** is employed as an identifiable logical unit. The transmitted MSDUs and the MSDU fragments are logically divided into blocks that never change but MAY be assembled differently when retransmitting the data.

The parameter **ARQ_BLK_SIZE** should be of the form 2^N . It defines the block size in bytes. It is negotiated between the peers during the connection creation/change. **ARQ_BLK_SIZE** may vary from 1 to TBD bytes.

The block size MAY be more than the maximum MAC Message size. Then the only incomplete blocks appear.

Another parameter is acknowledgment window size **ACK_WIN_SIZE** that limits the amount of the blocks, transmitted but not acknowledged.

6.2.4.1.2 Transmitter Operations: MAC Message Creation and Numbering

The following is the sequence of MAC operations at the transmitting side with ARQ enabled

1. The complete MSDUs and fragments are logically divided into portions (**ARQ blocks**) of the given size **ARQ_BLK_SIZE**. The last block in the MSDU MAY be smaller than **ARQ_BLK_SIZE**, such a block is called incomplete block. Once defined as a piece of data, block never changes (split or recombined)
2. A set of blocks is selected for the transmission and aggregated into MAC Messages. This set may include also the blocks selected for the retransmission. At this step fragmentation of the MAC messages MAY be performed so that the fragment boundary MUST be aligned to a block boundary. A Sequential Number should be assigned to any block not having yet such a number. Sequential Numbers, taken in the order of their assignment, form a sequence of numbers $0 \dots 2^N - 1$ where N is the number bits (with wrap-around at 2^N). The following are the restrictions:
 - Only contiguous Block Sequential Numbers may appear within a single MAC Message
 - An incomplete block may be placed only at the end of a MAC Message or at the end of partial payload in the case of packed MAC Message
3. Each MAC Message gets a Sequential Number, which is the Sequential Number of the FIRST block in the MAC Message. This number is encoded in the ARQ sub-header (see XXX). Note that according to MAC rules, if a payload (partial payload) of

a MAC message contains a MSDU fragment, it should be described correspondently in the Fragmentation Sub-header or Packing Sub-header.

It is a matter of transmitter s policy whether the set of blocks once transmitted as a single MAC Message, will be retransmitted also as a single MAC Message.

The following pictures will replace the correspondent figures from 6.3.2 (01/01 document)

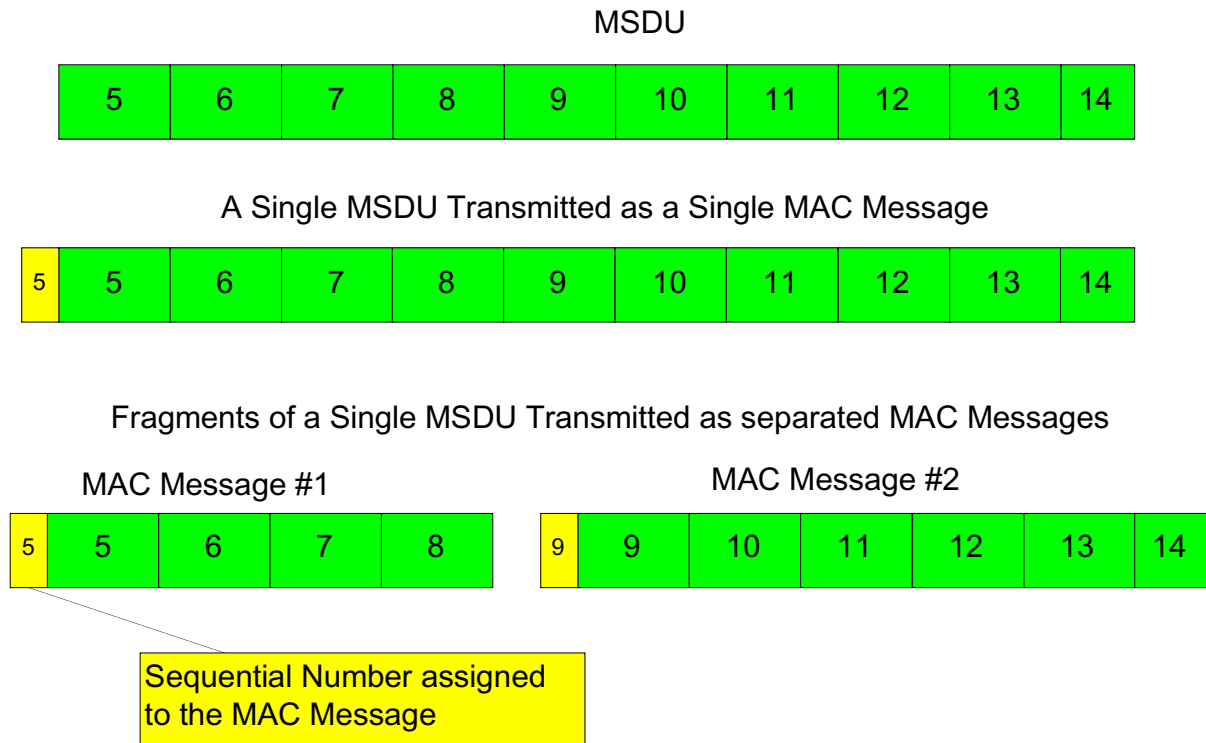
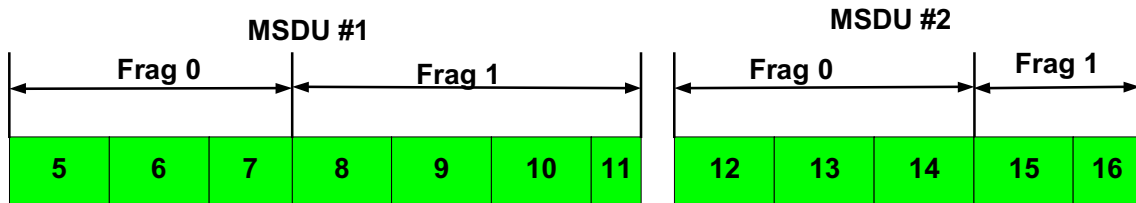
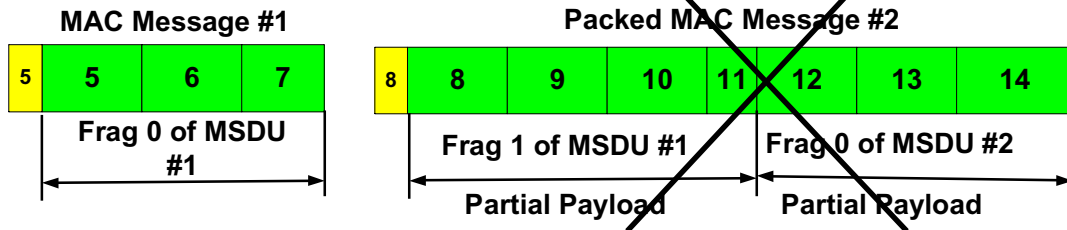


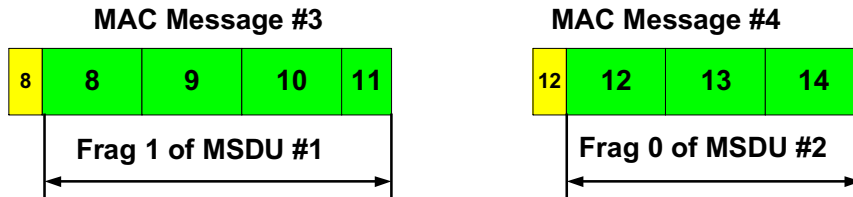
Figure 1. Options for the MSDU transmission



Original Transmission



Retransmission with rearrangement of MAC Messages



Retransmission without rearrangement of MAC Messages

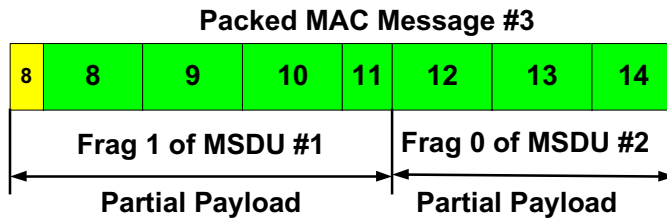
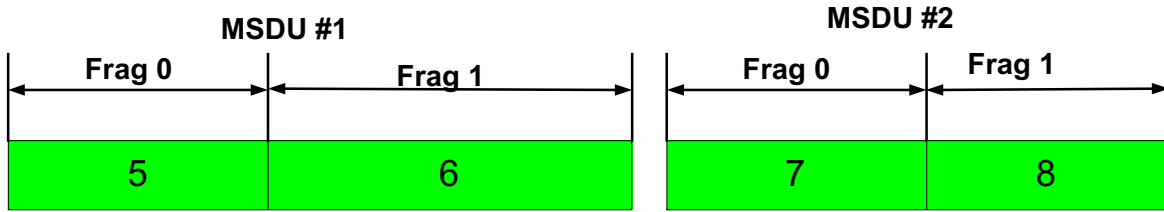
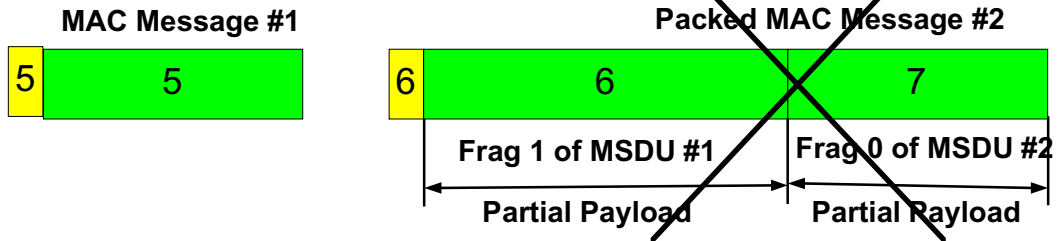


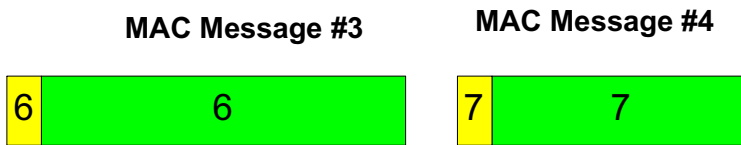
Figure 2. Retransmission with and without the rearrangement of MAC Messages



Original Transmission



Retransmission with rearrangement of MAC Messages



Retransmission without rearrangement of MAC Messages

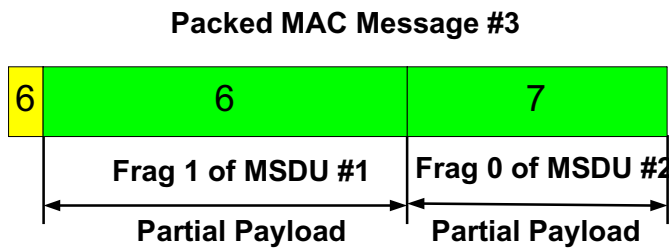
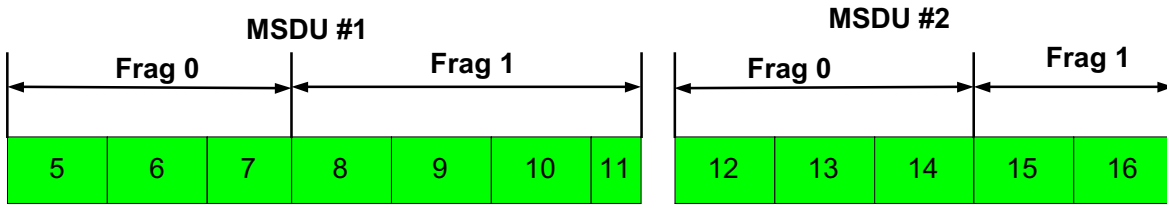


Figure 3. Retransmission with and without the rearrangement of MAC Messages



MAC Messages

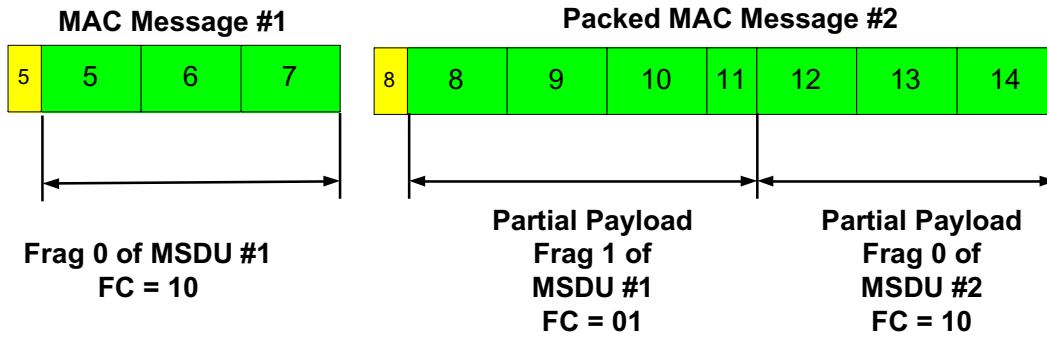


Figure 4. Interaction between the ARQ numbering and fragmentation signaling