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Abstract	ARQ selective bitmap clarifications
Purpose	
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ARQ selective bitmap clarifications

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1. Motivation

ARQ selective bitmap size is in 16 bits resolution, the std does not specify an un-ambiguity way for the receiver to give feedback for number of blocks which are not a multiple of 16.

We suggest to left align the ACK bit MAP to the highest block number to be reported.

The two following example shows the ambiguity in the current scheme:

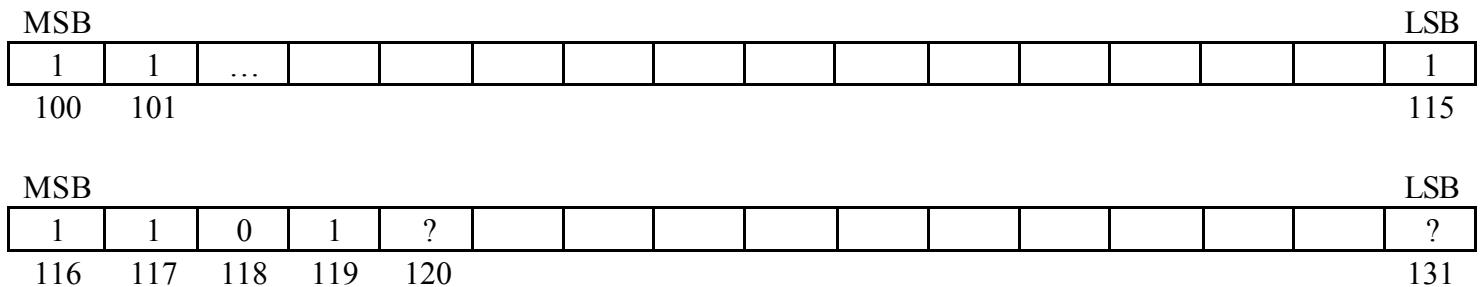
1.1. Example

Receiver would like to report success for blocks 100 to 117, failure for block 118 and success for block 119.

The receiver will fill the following values to the MAP Feedback IE:

- BSN=100
- Number of Ack Maps = 2
- Ack type = 0

The two MAPS will look as follows:



There is an ambiguity on BSN 119 to 131. If zero will be used as a report does it indicate NACK or should it be ignored?

The line 54 at page 137 specifies:

“A bitmap entry not indicating acknowledgement shall be considered a NACK for the corresponding blocks.”

2. Proposed solution No 1

In the selective ACK case (ACK type 0x0 and 0x2) BSN should be assign appropriately so that the last block to be reported is reported via the LSB of the last ACK Map .

The BSN field should be adjusted accordingly - BSN of last reported block number minus the total MAPs size.

The following shows how the suggestion solution been applied to the previous example:

2.1. Example's solution

Receiver would like to report success for blocks 100 to 117, failure for block 118 and success for block 119.

The receiver will fill the following values to the MAP Feedback IE:

- BSN= 86
- Number of Ack Maps = 2
- Ack type = 0

The two MAPS will looks as follows:

MSB										LSB				
Note1	Note1	Note1	1	1	1	1
87	88									99	100	101	102	103

MSB										LSB				
1	1	1	0	1	
104										116	117	118	119	

Note1: BSN 87 to 99 where reported in a previous IE, and are reported again.

3. Changes summary for solution No 1

[Make the following changes to the end of the third paragraph of section 6.3.4.2 "ARQ feedback IE format ":]

BSN

If (ACK Type == 0x0): BSN value corresponds to the most significant bit of the first 16-bit ARQ ACK map.

If (ACK Type == 0x1): BSN value indicates that its corresponding block and all blocks with lesser (see 6.3.4.6.1) values within the transmission window have been successfully received.

If (ACK Type == 0x2): Combines the functionality of types 0x0 and 0x1.

If (ACK Type == 0x3): Combines the functionality of type 0x1 with the ability to acknowledge reception of ARQ blocks in terms of block sequences. A block sequence is defined as a set of ARQ blocks with consecutive BSN values. With this option, members of block sequences are identified and associated with the same reception status indication.

Selective ACK Map

Each bit set to one indicates the corresponding ARQ block has been received without errors. The bit corresponding to the BSN value in the IE, is the most significant bit of the first map entry. The

bits for succeeding block numbers are assigned left-to-right (MSB to LSB) within the map entry. If the ACK Type is 0x2, then the most significant bit of the first map entry shall be set to one and the IE shall be interpreted as a cumulative ACK for the BSN value in the IE. The rest of the bitmap shall be interpreted similar to ACK Type 0x0.

In the selective ACK case (ACK type 0x0 and 0x2) BSN should be assign appropriately so that the last block to be reported is reported via the LSB of the last ACK Map.

[Add at the end of paragraph 6.3.4.2 add the following]

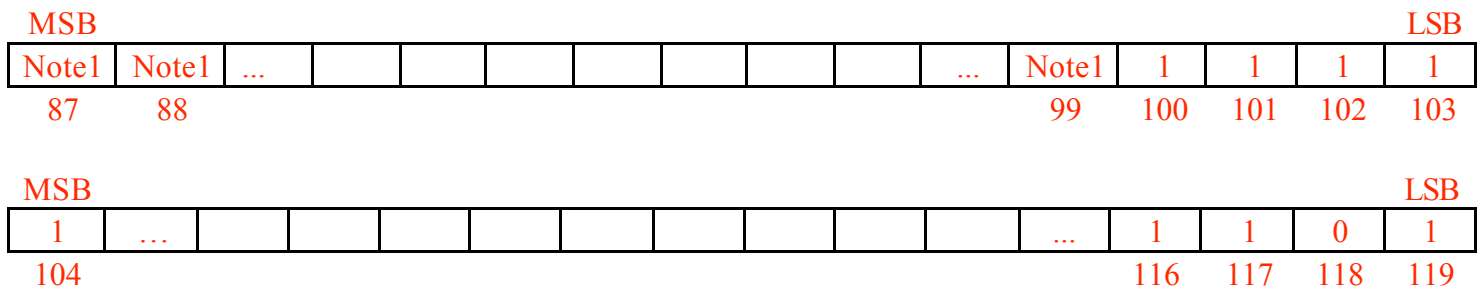
Examples for Selective ACK Map (ACK Type= 0x0 or 0x2) usage:

Receiver would like to report success for blocks 100 to 117, failure for block 118 and success for block 119.

The receiver will fill the following values to the MAP Feedback IE:

- BSN= 87
- Number of Ack Maps = 2
- Ack type = 0 /2

The two MAPs will look as follows:



Note1: BSN 87 to 99 where reported in a previous IE, and are reported again. In case those BSNs where not reported in a previous IE (i.e. block number 100 is the first block transmitted on this CID), the report bit of those blocks should be ignored by the transmitter.

4. Proposed solution No 2

This solution keeps the left adjustment originally defined, and states explicitly that all the zeros after the last reported 1 (ACK) should be ignored and don't represent a NACK but a 'not yet reported' condition.

This assumes that the receiver should always report in one single message up to the last ACKed BSN, and if necessary should include more than one ARQ_feedback_IE in the message. This is necessary if the bit 65 is to be reported as an ACK, this takes more than 4 maps.

5. Changes summary for solution No 2

[Add the following text after line 54 page 137 section 6.3.4.6.2]

A bit map entry not indicating acknowledgement shall be considered a NACK for the corresponding blocks.

For a **Selective ACK Map**, all 'zero' bits, after the last 'one' bit of the last **Selective ACK MAP** of the last **ARQ_feedback_IE** for a given CID should not be considered a NACK, but should be ignored.