

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	H-ARQ MAP Clarification & Change	
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Re:		
Abstract	The document contains clarifications and corrections for H-ARQ MAP.	
Purpose	Adoption of proposed changes into IEEE P802.16maint-04/10 and P802.16d /D5-2004	
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1 Introduction

In 802.16d, H-ARQ MAP is defined. But, the operation scenario of H-ARQ MAP is not clear still. Hence, this document describes clarifications and corrections for H-ARQ MAP operation.

2 Clarification & Change Items

2.1 H-ARQ MAP message burst clarification

Motivation

When both H-ARQ MAP burst and UL-MAP burst exist, the H-ARQ MAP burst appear first. But MSS shall decode UL-MAP message first because H-ARQ MAP message may contain UL burst allocation.

To remove the confusion of MAP decoding order, the text below describe the limitation of H-ARQ MAP burst appearance.

[Change text in IEEE P802.16maint-04/10 as follows in page 18]

6.3.2.3.43.1 H-ARQ MAP message format

Change text in the second paragraph as indicated:

BS may broadcast multiple H-ARQ MAP messages using multiple bursts after the MAP message. Each HARQ MAP burst which contains H-ARQ MAP message ~~should~~ shall have a different modulation and coding rate. When H-ARQ MAP burst appears, Compressed DL/UL MAP shall be used instead of DL MAP. MS starts decoding of H-ARQ MAP message after decoding of Compressed DL/UL MAP message.

2.2 Start position of H-ARQ DL burst clarification

Motivation

Because the DL burst defined by the H-ARQ MAP is allocated only by the length, exact start position for the burst allocation is required. However, in current standard the description about the start position of the burst is not clear when the burst defined by DL-MAP message exists.

The text below describes the start position of the DL burst defined by the H-ARQ MAP message.

[Change text in IEEE P802.16maint-04/10 as follows in page 20]

6.3.2.3.43.6.1 Compact DL-MAP IE for normal subchannel

Change the first paragraph as indicated:

The format of Compact DL-MAP IE for normal subchannel is presented in Table 96. The allocation of DL normal subchannel burst and DIUC subchannel burst start from the next symbol of the last DL-MAP burst. The direction of slot allocation for downlink is along with the subchannel index first and then the symbol index. The direction of data mapping shall be according to 8.4.3.4.

2.3 Start position H-ARQ UL burst clarification & correction

Motivation

In the last meeting, the Compact UL-MAP IE for allocation start offset had been added to indicate the start position of Compact UL MAP burst. The original modification had only 8 bits start offset, but that is not enough to indicate the start position correctly. Hence we added additional Start subchannel offset field.

[Change text in IEEE P802.16maint-04/10 as follows in page 24]

6.3.2.3.43.7.8 Compact UL-MAP IE for Allocation start offset

The format of Compact UL-MAP IE for allocation start offset is presented in Table 106.

Table 106—H-ARQ Compact_UL-MAP IE format for allocation start offset

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
UL-MAP Type =7	3 bits	
UL-MAP subtype	5 bits	Extension subtype
Length = ± 2	4 bits	Length of the IE in bytes
Start symbol offset	5 bits	Offset from the start of UL sub-frame
Start subchannel offset	8 bits	Number of slots
}		

UL-MAP Type

Specifies the type of the compact UL-MAP IE. A value of 7 indicates the extension type.

UL-MAP Subtype

Specifies the subtype of the compact UL-MAP IE.

Length

Indicates the length of this IE in bytes. If an SS cannot recognize the UL-MAP Subtype, it skips the IE.

[Start symbol offset](#)

[A subsequent H-ARQ UL data burst allocation shall start from the symbol specified in the value. However, this value does not affect to the ranging region, CQICH region, and H-ARQ ACK region.](#)

Start [subchannel](#) offset

A subsequent H-ARQ UL data burst allocation [shall](#) start ~~after the number of slots~~ [from the subchannel](#) specified in the value. ~~The offset calculated from the most recent zone defined in either UL-MAP or H-ARQ MAP.~~ However, this value does not affect to the ranging region, CQICH region, and H-ARQ ACK region.

2.4 Repetition coding indication of H-ARQ MAP Pointer IE

Motivation

The discussion about including repetition coding indication field in Compact DL-MAP for DIUC, Compact UL-MAP for UIUC, and H-ARQ MAP Pointer IE had been made in the corrigenda session at the last September meeting.

Hence, the Compact DL-MAP for DICU and Compact UL-MAP for UIUC now contain the repetition coding indication field.

But, no text change has been made for H-ARQ MAP pointer IE yet.

The text below put repetition coding indication into H-ARQ MAP pointer IE.

[Change text in IEEE P802.16d /D5-2004 as follows in page 531]

8.4.5.3.10 H-ARQ MAP Pointer IE

This IE shall only be used by a BS supporting H-ARQ, for SS supporting H-ARQ.

Table 283—H-ARQ MAP pointer IE format

Syntax	Size	Notes
H-ARQ MAP Pointer IE () {		
Extended DIUC 4 bits HARQ_P = 0x07		
Length 4 bits Length = 0x02		
AMC DIUC	4 bits	Indicates the AMC level of the burst containing a H-ARQ MAP message.
No. Slots	8 bits	The number of slots allocated for the burst containing a H-ARQ MAP message.

Repetition Coding Indication	2 bits	
<i>reserved</i> 4 2 bits Shall be set to zero		
}		

2.5 Clarification for CQICH Region allocation

Motivation

The role of fast feedback region defined by DL-MAP and the CQICH region defined by H-ARQ MAP is the same, providing CQI channel. The only difference is that fast feedback region is 1-dimensional and CQICH region is 2-dimensional.

Because two different IE for CQI exist in two different MAP, we need clarification of CQI channel allocation.

There are 4 cases:

1. Only fast feedback region exists

Both CQI allocation IE in DL-MAP and CQICH control IE in H-ARQ MAP shall allocate a CQI channel in the fast feedback region.

2. Both fast feedback region and CQICH region exist

The CQICH control IE in H-ARQ MAP shall allocate a CQI channel in the CQICH region.

3. Only CQICH region exists

Only the CQICH control IE in H-ARQ MAP shall allocate a CQI channel in the CQICH region.

4. No region for CQI exists

No CQI channel allocation is possible.

[Change text in IEEE P802.16maint-04/10 as follows in page 23]

6.3.2.3.43.7.6 Compact UL-MAP IE for CQICH Region allocation

Change the first paragraph as indicated:

The CQI region information is delivered through the Compact UL-MAP IE as shown in Table 107. SS sends CQI report in CQI region. The CQICH control IE allocates a CQI channel in a CQICH region.

When no CQICH Region allocation IE exists in H-ARQ MAP then fast feedback region shall be used instead for CQICH region.

2.6 Clarification for H-ARQ ACK Region allocation

Motivation

H-ARQ ACK region may appear in the head UL-subframe. However, a SS which does not support H-ARQ can't find the region, because H-ARQ ACK Region allocation IE is in H-ARQ MAP message. Thus a SS may consider the region as empty region and try to find a first data burst in that region.

To fix this problem, BS may allocate large Fast Feedback region in DL-MAP message and override a part of the Fast Feedback region as a H-ARQ ACK region.

[Insert sentence in IEEE P802.16d /D5-2004 as follows in page 123, section 6.3.2.3.43.7.5]

6.3.2.3.43.7.5 Compact UL-MAP IE for H-ARQ Region allocation

H-ARQ ACK Region may override Fast feedback Region. This means that when the Compact UL-MAP IE for H-ARQ ACK Region indicates the same region which is allocated for CQICH, then the region shall be used for H-ARQ ACK region.