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Re:	This is a response to a Call for Comments on IEEE P802.16e-D5a	
Abstract	we propose the method of using Feedback header which can report large amount of Feedback values	
Purpose	This document is submitted for review by 802.16e Working Group members.	
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Feedback request subheader

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1. Introduction

In the current spec, the BS requires several feedback values from MSS for optimizing DL. The required several feedback values are decided by BS through the Feedback Type field. The Feedback types are described according to Table 7b. The BS uses Fast-feedback allocation subheader and CQICH_allocation IE to assign UL Fast feedback channel to MSS, it also uses Feedback Polling IE to assign UL resource to MSS.

As mentioned above, there are several methods for receiving Feedback values.

- First, the BS sends Fast-feedback allocation subheader that includes the requested Feedback type and the allocation offset in the UL Fast-feedback channel to MSS. An MSS reports the Feedback values through UL Fast-feedback channel at the UL sub-frame of two frames ahead of the current frame
- Second, the BS sends CQICH_allocation IE that contains requested Feedback type, reporting period, and the allocation offset in the UL Fast-feedback channel to MSS. An MSS reports the Feedback values through UL Fast-feedback channel periodically.
- Third, the BS sends Feedback Polling IE that contains requested Feedback type, reporting period, and the duration in UL slot. An MSS reports Feedback values through the single Feedback header.

However, when BS requests Feedback values through CQICH_allocation_IE or Fast feedback allocation subheader, it can develop several problems

- First, Using the CQICH_allocation_IE or the Feedback Polling IE, DL-MAP or UL-MAP may enlarge, respectively.
- Second, Using the Fast feedback allocation subheader, it is not enough to express all feedback types. Also, it is hard for MSS to report large amount of Feedback values through assigned Fast feedback channel.
- Third, the BS needs to control the polling time when an MSS start reporting Feedback values. Because MSS may need CINR measurement time more than fixed frame.

Therefore, we introduce another method for allocation UL resource and for indicating various Feedback contents with Feedback request subheader when there is data packet in MSS. Also, this subheader contains the frame offset to indicate where allocation should be applied in frame.

2. Proposed Text Change

2.1. Use reserved bit for indicating exist Feedback request subheader in the Generic MAC header.

[Modify 6.3.2.1.1, Figure 19a – Generic MAC header]

This Generic MAC header has MSF(1) bit that is only applicable to UL.

In the DL case, this bit indicates whether Feedback request subheader is present or absent.

HT=0 (1)	EC (1)	Type (6)	MSF (1) – Only applicable to UL <u>FRS (1) –</u> <u>Only applicable to</u> <u>DL</u>	CI(1)	EKS(2)	Rsv(1)	LEN MSB (3)
LEN LSB (8)			CID MSB (8)				
CID LSB (8)			HCS (8)				

[Add the following entries to Table 5a:]

Table 5a – Generic MAC header fields

Name	Length(bits)	Description
<u>FRS</u>	<u>1</u>	<u>Feedback request subheader, this field is used in the DL only. If FRS=0, the Feedback request subheader is absent. If FRS=1, the Feedback request subheader is present.</u> <u>A MSS that is capable of Feedback request Subheader indication shall only decode FS field sent by the BS. Otherwise, MSS shall treat this as if set to 0, The BS shall set this bit and send the Feedback request subheader only if is successfully negotiated the support of Feedback request subheader with a MSS. The Feedback request subheader indication capability is specified as part of the capabilities exchange dialog (REG-REQ/RSP)</u>

[Modify the following sentence in the Line 48, page 22]

~~Six~~ Seven types of subheaders may be present in a MAC PDU with generic MAC header. The per-PDU subheaders (i.e., Mode Selection Feedback, Mesh, Fragmentation, Fast-feedback allocation and Grant Management) may be inserted in MAC PDUs immediately following the Generic MAC header. If both the Fragmentation subheader and Grant Management subheader are indicated, the Grant Management subheader shall come first. If the Mesh subheader is indicated, it shall precede all other subheaders. In the downlink, the FAST-FEEDBACK Fast-feedback Allocation subheader shall always appear as the last per-PDU subheader, while in the uplink the Mode Selection Feedback subheader shall always appear as the last per-PDU subheader. The feedback request subheader, if indicated in DL Generic MAC header, shall always appear as the last per-PDU subheader in a DL MAC PDU. The Mode selection Feedback subheader, if indicated in UL Generic MAC header, shall always appear as the last per-PDU subheader in a UL MAC PDU.

2.2. Introduce a new Feedback Subheader for MSS to use Feedback header.

[Add the following sentence to Table 5a:]

6.2.2.8 Feedback request subheader

This format of Feedback request subheader is specified in Table 14a. The Feedback subheader, when used, shall always be the last per-PDU subheader as specified in 6.3.2.2. The support of Feedback subheader is PHY specification specific.

The BS uses the Feedback request subheader to allocation dedicated UL resource for obtaining the feedback value form an MSS

<u>Syntax</u>	<u>Size (bits)</u>	<u>Notes</u>
<u>Feedback request subheader {</u>		
<u>UIUC</u>	<u>4</u>	
<u>Feedback type</u>	<u>4</u>	<u>Shall be set according to Table 7b</u>
<u>Allocation offset</u>	<u>6</u>	
<u>No.slots</u>	<u>1</u>	<u>Number of slots that is given in multiples of 2.</u>
<u>Frame offset(F)</u>	<u>1</u>	<u>Indicate to start reporting at the frame</u>
<u>}</u>		

Allocation offset

Define the offset, in unit of slots, begin from the ending slot which occupies the highest numbered subchannel in the highest numbered OFDMA symbol of UL sub-frame.

No.slots

Define the allocation duration in OFDMA slots. The maximum of No.slots is four.

Frame offset (F)

Indicate that MSS starts reporting at the frame. If F == 0, the allocation applies to the UL subframe two frames ahead of the current frame. If F==1, four frames ahead of the current frame.

[Modify the following section 11.7.17:]

11.7.17 MSS Mode Selection Feedback support

This field indicates the support of Mode Selection Feedback.

Type	Length	Value	Scope
20	1	Bit #0 : Mode Selection Feedback sub-header Supported Bit #1 : Mode Selection Feedback header Supported <u>Bit #2 : Feedback request subheader Supported</u> <u>Bit #3-#7 : Reserved</u>	REG-REQ REG-RSP