Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Fix problems in Feedback Polling IE**
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Re:	Response to Sponsor Ballot on IEEE802.16e/D7 document
Abstract	Fix problems in Feedback Polling IE
Purpose	To incorporate the text changes proposed in this contribution into the 802.16e/D8 draft.
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Fix Problems in Feedback Polling IE

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1. Problem Statement

The Feedback Polling IE in IEEE802.16e/D7 allocates dedicated UL resource to transmit Feedback header in designated future frames. This mechanism contains the following problems:
- "Duration" is used in Feedback Polling IE to allocate dedicated UL resource, however, the start position of duration can not be determined at the a future frame.
- Duration is 10bits long which is not necessary since Feedback polling header is only 6 bytes long.
- A different MS entered the network after Feedback Polling IE is transmitted would not know to skip the UL allocation done by Feedback Polling IE
- Since UCD message might change the mapping of UIUC, the UIUC included in Feedback Polling IE might be changed when the Feedback header is transmitted.
- Feedback polling Header is in the wrong section, it should belong to UL-MAP
- UIUC value for Feedback polling header is missing

2. Proposed Solutions

The proposed changes are following:
- Add a dedicated UL allocation indication bit to Feedback Polling IE. When the dedicated UL allocation indication bit is set to zero, ~~Remove all allocation done~~ dedicated UL allocation will not be included in Feedback polling IE. In this case, Feedback polling IE is only used to inform the MS when to transmit Feedback header. UL_MAP should include a normal UL allocation for this MS at the frame the Feedback header is scheduled to be transmitted. When the dedicated UL allocation indication bit is set to 1, Feedback polling IE will include dedicated UL allocation. However, in this case, it is recommended that the dedicated UL allocation in Feedback polling IE are the last slots of a UL subframe.
- When UL Resource allocation is included in Feedback polling IE, subchannel and OFDMA symbol offset is included to indicate the beginning of UL allocation. Also, duration is changed to 3 bits long.
- Move entire section to UL MAP section
- Assign extended UIUC-2 value to this IE.

3. Specific Text Changes

[Feedback polling IE should belong to the UL-MAP section. So, create a new section 8.4.5.4.28 Feedback polling IE, move content of section 8.4.5.3.20 to Section 8.4.5.4.29, insert the section after Table 302r, page 376. Also modify section as following:Modify the following section:]

8.4.5.3.204.29 Feedback polling IE

This IE is used by BS to allocate dedicated UL resource to schedule Feedback header transmission by the MS. When the Dedicated UL Allocation bit is set to 1, a dedicated UL allocation shall be included in this IE. The dedicated UL allocation shall be used by the MS to transmit Feedback header at the designated Feedback header transmission frame defined by this IE. When the Dedicated UL Allocation bit is set to 0, no dedicated UL allocation shall be included. Instead, aAt the designated transmissiontting frame defined by this IE, the MS shall compose the Feedback header and the BS shall include a dedicated UL allocation for the transmission using normal UL MAP IE.

Table 285i302s—Feedback polling IE format

Syntax	Size	Notes
Feedback polling IE () {	—	—
Extended-2 UIUC	4	0x0F??
Length	84	Length in bytes of following fields
Num_Allocations	4	
Dedicated UL Allocation Included	1	0: No dedicated UL resource is allocated in feedback polling IE. BS shall allocate UL resource for the Feedback header transmission at each designated transmitting frame defined by this IE 1: Dedicated UL resource is included
Reserved	3	set to zero
for (i=0; i < Num Allocations; i++) {	—	—
Basic CID	16	—
Allocation Duration (d)	3	The allocation is valid for 10_2d frame starting from the frame defined by Frame_offset If d == 0b000, the the pre-scheduled Feedback header transmission is released If d == 0b111, the the pre-scheduled Feedback header transmission shall be valid until the BS commands to release it.
If (d != 000) {		
UIUC	4	—
Feedback type	4	See Table 7i
Duration	10	In OFDMA slots (see 8.4.3.1)
Frame Offset	3	The offset (in units of frames) from the current frame in which the first UL feedback header shall be transmitted on the allocated UL resource. A value of zero0/1 indicates the subsequent frame
Period (p)	2	The UL resource region is dedicated to the MS in every 2p frame
If (Dedicated UL Allocation Included == 1) {		
UIUC	4	
OFDMA symbol offset	8	
Subchannel offset	7	

Duration	3	In OFDMA Slots
Repetition coding indication	2	0b00 – No repetition coding 0b01 – Repetition coding of 2 used 0b10 – Repetition coding of 4 used 0b11 – Repetition coding of 6 used
~~Allocation Duration (d)~~	~~3~~	~~The allocation is valid for 10_2d frame starting from the frame defined by Frame_offset~~ ~~If d == 0b000, the dedicated allocation is de-allocated~~ ~~If d == 0b111, the dedicated resource shall be valid until the BS commands to de-allocate the dedicated allocation~~
}		
}		
}	—	—
Padding bits	variable	To align octet boundary
}	—	—

Feedback type
　　　　See Table 7i.

Allocation offset
　　　　The UL feedback shall be transmitted in the frame which is 0-8 frame delay relative to the current frame.

Duration
　　　　In OFDMA slots (see 8.4.3.1)

Period (p)
　　　　The UL resource region is dedicated

Dedicated UL Allocation
　　　　0: No dedicated UL resource is allocated in feedback polling IE. BS shall allocate UL resource for the Feedback header transmission at each designated transmitting frame defined by this IE
　　　　1: Dedicated UL resource is included

OFDMA symbol offset
　　　　The offset of OFDMA symbol symbol in which the burst starts, measured in OFDMA symbols from beginning of the designated transmission uplink frame for feedback header

Subchannel offset
　　　　The lowest index OFDMA subchannel used for carrying the burst, starting from subchannel 0.

4. References

[1]　　　　IEEE 802.16- 2004 IEEE Standards for local and metropolitan area networks part 16: Air interface for fixed broadband wireless access systems
[2]　　　　IEEE P802.16e-D7-2005