Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Enhanced mode selection feedback initiated by MSS through MAC subheader
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Re:	IEEE P802.16e/D3-2004
Abstract	In this contribution, the method for MSS initiated mode selection feedback using MAC subheader is proposed. This is revision 1 of the contribution. The additional texts are highlighted in 'green'. Deleted texts are crossed-out.
Purpose	Review and Adopt the suggested changes into P802.16e/D3
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1 Introduction

In IEEE802.16e/D3 text, mode selection feedback is sent on the fast feedback channel by the MSS, to select different MIMO and permutation modes. The mode selection feedback is either sent periodically on the CQICH as defined by the CQICH_Alloc_IE() or sent when polled by the BS using the FAST-FEEDBACK allocation subheader.

In the case of periodic mode selection feedback, the MSS has to send the mode selection information even though the information has not changed from the one previously reported or a MSS has to wait until the next mode selection feedback opportunity to send the mode selection information. In the case of polling by the BS, the BS has no information on when the mode selection at the MSS has changed, and therefore the polling is typically done periodically. In both cases, the UL resource is unnecessarily used. In the latter case, the DL resource is also unnecessarily used.

Typically, the mode selection at the MSS does not change frequently. However, when the mode selection does change, the information needs to be fed back with minimum delay so that the newly selected can take effect quickly. Both the periodic feedback and the BS-polling-based feedback in the existing IEEE802.16e/D3 are not efficient in supporting the mode selection feedback.

We therefore propose that the MSS sends the mode selection feedback information on a newly proposed UL MAC subheader when the selected mode has changed from the one previously reported and when the MSS has UL resource assigned to transmit UL traffic. This proposal is complementary to the proposal in "Enhanced mode selection feedback initiated by MSS through Mode Selection Feedback MAC Header" which is used for the case when the MSS has no UL resource assigned for UL traffic transmission when a mode change occurs.

In this proposal, the generic MAC header is modified by using the Reserved bit (applicable only to UL) to indicate the presence of the Mode Selection Feedback Subheader. The Mode Selection Feedback MAC header contains the Feedback type (MIMO mode and permutation feedback), and the Feedback content (i.e. content of the MIMO mode and permutation feedback). Note that the reserved values in the Feedback type and Feedback content can be used to support future types of feedback. ~~The one-byte Mode Selection Feedback Subheader carries either the MIMO mode and permutation selection or the Anchor BS selection for the support for SHO and fast BS switching.~~

2 Proposed Text Change

2.1 Modification of Generic MAC header

[*Modify 6.3.2.1.1, Figure 19 –Generic MAC header]. In the UL generic MAC header, the reserved bit is replaced by Mode Selection Feedback type bit. If Mode Selection Feedback type bit = 0, the Mode Selection Feedback Subheader is absent; If Mode Selection Feedback type bit = 1, the Mode Selection Feedback Subheader is present.*

The BS shall only decode this Mode Selection Feedback type bit sent by an MSS capable of mode selection feedback indication. Otherwise, the BS shall ignore this bit. The mode selection feedback indication capability is exchanged in a new TLV defined for SBC-REQ/RSP]

Figure 19. Generic MAC header format.

HT=0 (1)	EC (1)	Type (6)	~~Rsv (1)~~ Mode Selection Feedback type (1) (only applicable to UL)	CI(1)	EKS (2)	Rsv (1)	LEN MSB (3)
LEN LSB (8)			CID MSB (8)				
CID LSB (8)			HCS (8)				

[insert the following sentences following Figure 19]

In the UL generic MAC header, if Mode Selection Feedback type bit = 0, the Mode Selection Feedback Subheader is absent; If Mode Selection Feedback type bit = 1, the Mode Selection Feedback Subheader is present.

The BS shall only decode this Mode Selection Feedback type bit sent by an MSS capable of mode selection feedback indication. Otherwise, the BS shall ignore this bit.

A MSS shall always ignore this field in DL generic MAC header.

Table 5 Generic MAC header fields

Name	Length (bits)	Description
Type	6	This field indicates the subheaders and special payload types present in the message payload
Mode Selection Feedback type (only applicable to UL)	1	If Mode Selection Feedback type bit = 0, the Mode Selection Feedback Subheader is absent; If Mode Selection Feedback type bit = 1, the Mode Selection Feedback subheader is present

2.2 Add a new Mode Selection Feedback Subheader

[Insert the following sentences in the end of section 6.3.2.2]

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.

[Add a new section 6.3.2.2.7]

6.3.2.2.7 Mode Selection Feedback Subheader

The format of Mode Selection Feedback subheader is specified in Table XX. The Mode Selcetion Feedback subheader, when used, shall always be the last per-PDU subheader as specified in 6.3.2.2. The support of the Mode Selection Feedback subheader is PHY specification specific.

The Mode Selection Feedback subheader is used by a MSS to provide its feedback in terms of mode selection ~~and anchor BS selection~~.

Table xx. Mode Selection Feedback subheader format.

Name	Length (bits)	Description
Feedback type	4	Indicate the type of feedback (see Table yy)
Feedback content	4	Content of the feedback

Table yy. Feedback type

Feedback type	Description
0b0000	MIMO mode and permutation. If set to this type, the Feedback content is as described in Table 296a.
~~0b0001~~	~~Anchor BS selection. If set to this type, the MSB of the Feedback content is set to '0', and the 3 LSBs of the Feedback content is set to the TEMP_BS_ID of the new Anchor BS.~~
~~0b0010~~0b0001-0b1111	Reserved

[Insert the following sentence into the end of Section 6.3.2.3.7]

The REG-REQ shall contain the following TLV:

SS Mode Selection Feedback support (11.7.11)

[Insert the following sentence into the end of Section 6.3.2.3.8]

The REG-RSP shall contain the following TLV:

SS Mode Selection Feedback support (11.7.11)

[Insert 11.7.11]

11.7.11 SS Mode Selection Feedback ~~sunheader~~ support

This field indicates the support of Mode Selection Feedback ~~subheader~~.

Type	Length	Value	Scope
20	1	Bit #0: Mode Selection Feedback subheader Supported Bit #1: Mode Selection Feedback Header Supported Bit #~~1~~2 - #7: reserved, shall be set to zero	~~SBC_REQ~~REG-REQ ~~SBC_RSP~~REG-RSP