Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	OFDMA ranging region allocation by UCD message
Date Submitted	2005-07-08
Source(s)	Kiseon Ryu, Bin-chul Ihm, Beomjoon Kim LG Electronics Voice: 82-31-450-1852 Fax: 82-31-450-7912 [mailto:ksryu@lge.com]
Re:	The document supports a comment at Sponsor Ballot on 802.16-2004/Cor1/D3 document
Abstract	The documents suggests the method for an BS to allocate ranging interval to SSs by UCD message.
Purpose	The document is for consideration during Sponsor Ballot comments resolution
Notice	
Release	
Patent Policy and Procedures	

OFDMA ranging region allocation by UCD message

Kiseon Ryu, Bin-chul Ihm, Beomjoon Kim
LG Electronics

Introduction

The reduction of broadcast message size is important for the usage of bandwidth more efficiently. In general, UL-MAP IEs with UIUC 12 for initial ranging and BW-REQ/periodic ranging should be frequently included in UL-MAP message regardless of rarely changed that information. If a BS omits UL-MAP IE with UIUC 12 in UL-MAP and SS is informed of allocated ranging region, it can reduce the broadcast message overhead. SS shall obtain UCD message associated with the BS before performing initial ranging during network entry. If a BS provides SSs with the information of allocated ranging region through UCD message, BS can omit UL-MAP IE with UIUC 12, and SS can perform initial ranging and BW-REQ/periodic ranging without receiving UL-MAP IE with UIUC 12. So, BS can reduce the broadcast UL-MAP message size at least 14 bytes every frame.

So, we propose the TLV parameter of UCD for allocating UL ranging region.

Proposed text change

[Add the text in 11.3.1 UCD channel encodings in table 353 at page 183, as follows :]

Name	Type (1 byte)	Length	Value
Normalized C/N override	175	8	This is a list of numbers, where each number is encoded by one nibble, and interpreted as a signed integer. The nibbles correspond in order to the list define by Table 334, starting from the second line, such that the LS nibble of the first byte corresponds to the second line in the table. The number encoded by each nibble represents the difference in normalized C/N relative to the previous line in the table.
Ranging Region	197	4 (one region) / 8 (two regions)	Bit #0-7 : **OFDMA Symbol offset** Bit #8-14 : **Subchannel offset** Bit #15-21 : **No. OFDMA Symbols** Bit #22-28 : **No. Subchannels** Bit #29-30 : **Ranging Method** (0b00: Initial Ranging/Handover Ranging over two symbols, 0b01: Initial Ranging/Handover Ranging over four symbols, 0b10: BW Request/Periodic Ranging over one symbol, 0b11: BW Request/Periodic Ranging over three symbols) Bit #31 : *reserved* (If length is 8 bytes, first 4 bytes indicates first ranging region and the following 4 bytes indicates another ranging region.)

[Remove the text at page 94, line 31-37, as follows:]

~~***Change the field 'Ranging_Change_Indication' in Table 268 as indicated:***~~

~~Ranging_Change_Indication*reserved*~~	~~1 bit~~	~~Shall be set to zero~~

[Modify the Table 268 in 8.4.4.3 DL Frame Prefix at page 94, line 31 as indicated:]

Change Table 268 as indicated:

Table 268—OFDMA downlink Frame Prefix format

Syntax	Size (bits)	Notes
DL_Frame_Prefix_Format() {	—	—
Used subchannel bitmap	6	Bit #0: Subchannel group 0 Bit #1: Subchannel group 1 Bit #2: Subchannel group 2 Bit #3: Subchannel group 3 Bit #4: Subchannel group 4 Bit #5: Subchannel group 5
~~**Ranging_Change_Indication**~~	~~1~~	~~—~~
Repetition_Coding_Indication	2	0b00 – No repetition coding on DL-MAP 0b01 – Repetition coding of 2 used on DL-MAP 0b10 – Repetition coding of 4 used on DL-MAP 0b11 – Repetition coding of 6 used on DL-MAP
Coding_Indication	3	0b000: CC encoding used on DL-MAP 0b001: BTC encoding used on DL-MAP 0b010: CTC encoding used on DL-MAP 0b011: ZT CC used on DL-MAP 0b100: LDPC encoding used on DL-MAP 0b101 to 0b111 – *Reserved*
DL-MAP_Length	8	—
Ranging_Region_Allocation_Indication	2	Bit #0: When set to 1, Initial Ranging region is allocated as defined by UCD message Bit #1: When set to 1, BW Request/Periodic Ranging region is allocated as defined by UCD message
reserved	~~4~~ 3	Shall be set to zero.
}	—	—

[Add the following text at page 94, line 65:]

Add the description of the 'Ranging_Region_Allocation_Indication' field below Table 268 as indicated:

Ranging_Region_Allocation_Indication

Indicates whether ranging region defined by UCD message is allocated or not. When the indication bit is set to "1", ranging region is allocated in the relevant UL subframe, which the UL-MAP refers to, as defined by the ranging region in UCD message. When the indication bit is set to "0", UL ranging region defined in UCD message is not allocated. In this case, BS may allocate ranging region by using UL-MAP-IE with UIUC=12 in UL-MAP.

Bit #0: Indicates whether Initial Ranging region defined in UCD message is allocated or not.

Bit #1: Indicates whether BW Request/Periodic Ranging region defined in UCD message is allocated or not.

[Add the following text in 6.3.10.3 OFDMA-based ranging, page 52, line 63 :]

6.3.10.3 OFDMA-based ranging

Insert the following sentence at the end of the section:

For OFDMA PHY the allocation of ranging opportunity inside a ranging allocation is defined in 8.4.7.4.

Insert at the end of 6.3.10.3 :

The BS may inform SSs of attributes of ranging regions with Ranging Region TLV in UCD (see 11.3.1). The UCD message may include ranging region for initial ranging and/or BW-Request/Periodic ranging region.

When Ranging Region TLV has been included in UCD message, the BS may allocate the ranging region using Ranging_Region_Allocation_Indications in FCH, without including ranging region allocations in the UL-MAP message. The BS shall set the Ranging_Region_Allocation_Indication bit to "1" if the BS is allocating a ranging region defined by UCD message (see 8.4.4.3). When the ranging region allocated by UCD message is changed, UCD Count in UL-MAP shall be incremented.

A BS may include UL-MAP IE with UIUC 12 in the UL-MAP message for ranging region allocation, regardless of UCD definitions,
When Ranging_Region_Allocation_Indication bit is set to " 0 ", the BS may provide ranging region allocations via UL-MAP_IE with UIUC 12. When Ranging_Region_Allocation_Indication bit is set to "1", the BS may provide ranging region allocations by both UCD and UL-MAP_IE with UIUC 12.