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Re:	The document supports a comment at Sponsor Ballot on 802.16e/D7 document	
Abstract	The documents suggests the method for an BS to allocate initial ranging interval to MSs using UCD message.	
Purpose	The document is for consideration during Sponsor Ballot comments resolution	
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Ranging region allocation using UCD message

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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 MS is informed of allocated ranging region, it can reduce the broadcast message overhead.
MS shall obtain UCD message associated with the BS before performing initial ranging during network entry or HO. If a BS provides MSs with the information of allocated ranging region through UCD message, BS can omit UL-MAP IE with UIUC 12, and MS can perform initial ranging and BW-REQ/periodic ranging without receiving UL-MAP IE with UIUC 12.

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

This contribution is revised one, and pink color indicates text change in revised version.

In r2 version compared with r0,

1. Deleting the text modification of DLFP for 128 FFT size in order that the proposal is applicable not to OFDMA for 128 FFT size.
2. Changing the definition of Ranging Region Allocation Indication in DLFP to remove ambiguity.
3. Modify the proposed text not to break backward compatibility.
4. Modify the proposed text to be only applicable to contention based ranging region allocation.
5. Capability negotiation parameter in SBC-REQ/RSP is added
6. Combining two TLVs for initial ranging and BW-REQ/periodic ranging to one TLV

Proposed text change

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

Name	Type (1 byte)	Length	Value

Tx power report	185	3	Bit#0~3: Tx_Power_Report_Threshold, It is unsigned integer and shall be read in dB scale. When "0b111" it means infinite. Bit#4~7: It is unsigned integer whose value is d. Its value 'd' shall be interpreted as Tx_Power_Report_Interval =2^d. When "0b111" it means infinite. Bit#8~11: _p_avg in multiples of 1/16 (range [1/16,16/16]) Bit#12~15: Tx_Power_Report_Threshold, It is unsigned integer and shall be read in dB scale. When "0b111" it means infinite. It shall be used when CQICH is allocated to the SS. Bit#16~19: It is unsigned integer whose value is d. Its value 'd' shall be interpreted as Tx_Power_Report_Interval =2^d. When "0b111" it means infinite. It shall be used when CQICH is allocated to the SS. Bit#20~24: _p_avg in multiples of 1/16 (range [1/16,16/16]), It shall be used when CQICH is allocated to the SS.
Ranging_Region	186	4 (one region) / 8 (two regions)	Bit 7:0 – **OFDMA Symbol offset** Bit 13:8 – **Subchannel offset** Bit 20:14 – **No. OFDMA Symbols** Bit 26:21 – **No. Subchannels** Bit #28-27 – **Ranging Method** (0b00: Initial Ranging over two symbols, 0b01: Initial Ranging over four symbols, 0b10: BW Request/Periodic Ranging over one symbol, 0b11: BW Request/Periodic Ranging over three symbols) Bit #31 -#29 : *reserved* (If length is 8 bytes, first 4 bytes indicates first ranging region and the following 4 bytes indicates another ranging region.)

[Modify the Table268 in 8.4.4.3 DL Frame Prefix at page 242:]

Table 268—OFDMA downlink Frame Prefix format for all FFT sizes except 128

Syntax	Size (bits)	Notes
DL_Frame_Prefix_Format() {	—	—
Used subchannel bitmap	6	Bit #0: ~~Subchannels 0-11 are used~~ Subchannel group 0 Bit #1: ~~Subchannels 12-19 are used~~ Subchannel group 1 Bit #2: ~~Subchannels 20-31 are used~~ Subchannel group 2 Bit #3: ~~Subchannels 32-39 are used~~ Subchannel group 3 Bit #4: ~~Subchannels 40-51 are used~~ Subchannel group 4 Bit #5: ~~Subchannels 52-59 are used~~ 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~~ 2	Shall be set to zero.
}	—	—

[Insert the following text before the last sentence in 8.4.4.3:]

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 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 133, line 43 :]

6.3.10.3 OFDMA-based ranging

[Insert at the end of 6.3.10.3]

The BS may inform MSs of attributes of ranging regions with Ranging Region TLV in UCD (see 11.3.1). The UCD message shall only include contention based ranging region for initial ranging and/or BW-Request/Periodic ranging region. A BS shall include UL-MAP IE with UIUC 12 when it assigns dedicated ranging region.

This capability is negotiated during basic capabilities negation phase (see 11.8.3.7.8)

When ranging region TLV for initial ranging and/or BW Request/Periodic ranging region has been included in UCD message, the BS may allocate the ranging region using Ranging_Region_Allocation_Indications in FCH, without including contention-based 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 contention-based 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 contention-based 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 allocations by both UCD or UL-MAP_IE with UIUC 12. In this case, SSs (compliant only with 802.16-2004) shall use ranging region allocated via UL-MAP_IE and MSs shall use ranging region allocated via UCD. Furthermore, UL-MAP_IE and UCD ranging region attributes shall be identical.

A BS shall include UL-MAP IE with UIUC 12 in UL-MAP message when it assigns uplink transmission opportunity to any SS

(compliant only with 802.16-2004).

[Add the capability negotiation for Ranging Region Allocation by UCD in SBC-REQ/RSP, page 533, line 27and 41 :]

11.8.3.7.8 OFDMA MAP Capability

The 'OFDMA MAP Capability' field indicates the different MAP options supported by a WirelessMANOFDMA PHY. This field is not used for other PHY specifications. A bit value of 0 indicates "not supported" while 1 indicates "supported."
Support for Extended HARQ IE in Normal MAP mandates a support for Sub MAP for first zone.
Bit #5 defines the capability of MS recognizing ranging region allocated by UCD message.(see 11.3.1, and 6.3.10.3)

Type	Length	Value	Scope
167	1	bit #0: HARQ MAP Capability bit #1: Extended HARQ IE in Normal MAP capability bit #2: Sub MAP capability for first zone bit #3: Sub map capability for other zones bit #4: DL region definition support bits #5:Ranging Region Allocation by UCD support bit #~~5~~6-7: *reserved*	SBC-REQ, SBC-RSP