Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Changes on DL-MAP_IE( ) in 802.16e OFDMA-PHY**
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Re:	This is a response to a Call for Comments IEEE 802.16e-03/18 on IEEE 802.16e-03/07r3
Abstract	This document contains suggestions to the improvement of the power saving efficiency and the lessening the processing burdens on the DL-bursts in OFDMA-PHY.
Purpose	The document is submitted for review by 802.16e Working Group members.
Notice	
Release	
Patent Policy and Procedures	

Changes on DL-MAP_IE( ) in 802.16e OFDMA-PHY

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1. Background

In IEEE 802.16 DL bursts only discriminate the burst profiles configuring the bursts, but not specific to the SSs. Thus in TDM mode of operation, each SSs virtually should decode every DL bursts to draw out the data addressed to the SS. This is not the problem in the application of Fixed Wireless, where SSs may not be supplied by the battery power. For the mobile SSs which are basically battery powered, that is the serious shortcomings.

In the other PHY-modes except the OFDMA-PHY in 802.16a and 802.16e, the DL bursts are strictly ordered by the robustness of the physical burst profiles, from the most robust burst profile to the least robust burst profile; the SS should decode the DL bursts up to the operational burst profiles. Since the DL resources are allocated by rectangles of subchannels and symbols pair in OFDMA-PHY, the strict order of modulation levels by their roubustness is not guaranteed. Thus each SS should decode the unwanted DL data bursts before it can validate the PDU header addressed to it. That causes the extra power consumption and imposes a burden in the receiver blocks, especially in the mobile environment for 802.16e.

Therefore, we suggest an alternative to the DL-MAP_IE to include the basic CIDs or broadcast CID of the addressed MSSs in the OFDMA-PHY for 802.16e. It should be subjected to the mobile specific environment only, not for the fixed wireless environments which can be supplied by the power lines. The suggested idea can help the corresponding MSSs to decode the specified DL bursts only and save their battery power during the remaining parts of the receiving periods.

MSSs can only decode the specified DL bursts only addressed by their basic CIDs or broadcast CID. We can reduce the additional overhead by addressing only the broadcast CID for the DL burst configured by broadcast messages and unicast messages, because the MSSs should decode the corresponding burst containing the broadcast messages whether the DL burst contains their basic CIDs or not.

2. Changes in IEEE 802.16e

[in 8.5.5.2.1]
Replace

Table 116bm1-OFDMA DL-MAP Information Element format

Syntax	Size	Notes
DL_MAP_Information_Element( ) {		
DIUC	4 bits	
If (DIUC == 15) {		
Extended DIUC dependent IE	Variable	AAS_DL_IE( )
} else {		
OFDM Symbol Offset	8 bits	
Subchannel Offset	5 bits	
Boosting	3 bits	000: normal (not boosted); 001: +6dB; 010: -6dB; 011: +9dB; 100: +3dB; 101: -3dB; 110: -9dB; 111: -12dB;

No. OFDM Symbols	8 bits	
No. Subchannels	5 bits	
Mini_Subchannel_index	3 bits	000 – no mini subchannels used; 001 – mini subchannel 1 is allocated; 010 – mini subchannel 2 is allocated; 011 – mini subchannel 3 is allocated; 100 – mini subchannel 4 is allocated; 101 – mini subchannel 5 is allocated; 110, 111 – reserved.
}		

To

Table 116bm1-OFDMA DL-MAP Information Element format

Syntax	**Size**	**Notes**
DL_MAP_Information_Element( ) {		
DIUC	4 bits	
If (DIUC == 15) {		
Extended DIUC dependent IE	Variable	AAS_Dl_IE( )
} else {		
Number of CID Elements *m*	8 bits	Number *m* of Basic CIDs and/or Broadcast CID configuring the DL Burst. If the Broadcast CID is included in this burst, the Number should be set to 1.
for (i = 0, i < *m*; i++) {		
CID	16 bits	16-bit Basic CID of the SS or Broadcast CID * In the case of Broadcast CID is allocated, other Basic CIDs are not necessary to be addressed.
}		
OFDM Symbol Offset	8 bits	
Subchannel Offset	5 bits	
Boosting	3 bits	000: normal (not boosted); 001: +6dB; 010: -6dB; 011: +9dB; 100: +3dB; 101: -3dB; 110: -9dB; 111: -12dB;
No. OFDM Symbols	8 bits	
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}		