Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	UL-MAP allocation in DL-MAP in OFDMA PHY
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Re:	IEEE P802.16e/D3-2004
Abstract	Defining that the PHY burst including UL-MAP will appear first in DL-MAP.
Purpose	
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UL-MAP allocation in DL-MAP in OFDMA PHY

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1.   Motivation

In OFDM PHY, UL-MAP always follows DL-MAP (see for example in OFDM PHY, 8.3.5.1, 4rd paragraph). This enables the SS to decode the UL-MAP in time and prepare the UL transmission. In OFDMA PHY there is no such definition, due to the concurrent nature of the PHY.

This creates a problem in the turnaround from reception of UL-MAP to transmission of UL burst by the SS. In case the UL-MAP is normal DL allocation in the DL-MAP (rather than concatenated to compressed DL-MAP) then, since the DL subframe may include many broadcast bursts, the SS has no way to tell which one includes the UL-MAP, and potentially will need to decode all the DL bursts, reaching to the UL-MAP last.

Since the UL-MAP is the most critical burst to decode after DL-MAP (from timing perspective), we suggest to define that UL-MAP allocation (a DL-MAP_IE pointing to the burst including UL-MAP) always appears first in the DL-MAP, if it appears. This would focus the decoder to work on this burst first.

2.   Details

Note that there are cases in which DL-MAP doesn't include an allocation for an UL-MAP. One case is UL-MAP concatenated to a compressed DL-MAP. Another is a private DL-MAP (e.g. in AAS mode), that may be sent on a regular burst allocation, in which case the UL-MAP may be also sent on that allocation, or may be pointed to by the DL-MAP.

The proposed rule doesn't contradict either usage model, and only requires that if the UL-MAP allocation appears in the DL-MAP, it will appear first (merely an ordering issue).

The proposed change is backward compatible with REVd.

3.   Changes summary

[Add the following text (between BEGIN and END) in p.9, line 43, before section 6.3.2.3.5]
BEGIN
    6.3.2.3.2 Downlink map (DL-MAP) message
    [add the following text at the end of the section]
    "The DL-MAP_IE that describes the PHY burst containing the UL-MAP (if such exists)
      will always appear first in the DL-MAP."
END

[add the following text (between BEGIN and END) before 8.4.6]
BEGIN

8.4.5.6.1 Compressed DL-MAP
[Add the following sentense at the end of the section]

"In case the UL-MAP is not appended to the DL-MAP, the DL-MAP_IE that describes the PHY burst containing the UL-MAP (if such exists) will appear first in the DL-MAP."
END