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Title	<b>Clarification on DL_MAP/UL_MAP Transmission</b>	
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Re:	Response to Sponsor Ballot call for comment	
Abstract	Clarification on DL_MAP/ULMAP transmission	
Purpose	To incorporate the changes here proposed into the 802.16e D6 draft	
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# Clarification on DL\_MAP/UL\_MAP Transmission

## 1 Introduction

According to the definition of the frame structure in 802.16e/D5, each frame in the downlink transmission begins with a preamble and the downlink transmissions period. The first four transmitted subchannels in the first data symbol of the downlink are used for FCH. Immediately following FCH is DL-MAP and UL-MAP. Although the OFDMA frame may include multiple zones, in which either PUSC or FUSC can be implemented, DL\_MAP and UL\_MAP are required to transmit in PUSC with CellID=0 in order for MSS to receive the control signal reliably. Moreover DL-MAP or UL-MAP allocation can not span over multiple zones. However, DL\_MAP and UL\_MAP are with variable length. For a BS has a shorter DL\_MAP/UL\_MAP, it needs to continue PUSC mode with CellID=0 in order to maintain PUSC SNR gain for other BS with longer DL\_MAP/UL\_MAP. In summary, to take advantage of PUSC permutation SRN gain, all BSs shall maintain PUSC transmission until all neighboring BSs finish the DL/MAP and UL/MAP transmission. However, due to the nature of variable length of DL\_MAP/UL\_MAP, there is no way for BS to know the proper time to switch to the other permutations. This effectively reduces usage of other permutation or zone usage.

The other related issues are that DL\_MAP contains IE which is unicast to certain MSSs, who may have very high SNR. For these IE's transmission, there is no need to use PUSC scheme with low modulation and low coding rate.

In this contribution, we propose to relax the constraint that DL\_MAP or UL\_MAP allocations must be transmitted in the same zone and add a parameter N\_SYMBOL\_DL\_MAP to allow smooth switching from PUSC to FUSC without negative impact on DL\_MAP detection.

## 2 Proposed solution

In the previous version 16e/D4, if DIUC = 14, it refers to the end of DL IE. This can be used to solve this problem. If we specify a maximum DL\_MAP length to certain number of OFDMA symbols. If the DL\_MAP requires can fit within the region, then the last IE will be end of MAP. If DL\_MAP requires more resources than the specified region, the last IE will allocate a data region to transfer the remaining DL MAP. This region may be in different permutation zone. The remaining IE may be transmitted with different burst profile specified in this last DL\_MAP\_IE().

## 3 Proposed Text Change

*Modify the text on page 502 in section 8.4.4.2 line 50.*

----- Start text -----

The OFDMA frame may include multiple zones (such as PUSC, FUSC, PUSC with all subchannels, optional FUSC, AMC and optional FUSC with all subchannels), the transition between zones is indicated in the DL-Map by the Zone\_switch IE (see 8.4.5.3.4). ~~No DL\_MAP or UL\_MAP allocations can span over multiple zones.~~ Figure 219 depict OFDMA frame with multiple zones. **The length of DL\_MAP shall not exceed N\_SYMBOL\_DL\_MAP OFDMA symbols. If the DL\_MAP requires more resources than N\_SYMBOL\_DL\_MAP OFDMA symbols, The last DL\_MAP\_IE() shall allocate a data region to carry the remaining DL\_MAP message. The allocated region may be in different permutation zone. The remaining DL\_MAP may be transmitted using the burst profile specified in this last DL\_MAP\_IE(). If the DL\_MAP can be transmitted within the N\_SYMBOL\_DL\_MAP OFDMA symbols, the last MAP\_IE shall be the end of map IE. N\_SYMBOL\_DL\_MAP can be one of these values: 2, 4, 6 or 8.**

----- End text -----

Delete the changes in the section 8.4.5.3.1