Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**Clarification of renumbering and permutation based on DL_PermBase parameter**	
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Re:	IEEE 802.16 WG Recirculation Ballot #17a on P802.16-2004/Cor1/D2	
Abstract	This contribution is for clarification of renumbering and permutation based on DL_PermBase parameter	
Purpose	To incorporate the text modification proposed in this contribution into P802.16-2004/Cor1/D3.	
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Clarification of renumbering and permutation based on DL_PermBase parameter

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1. Problem Statement

In section 8.4.6.1.2.1.1 of P80216_Cor1_D2, the text of downlink subchannel subcarrier allocation in PUSC mentions that DL_PermBase is used both for renumbering and permutation formulas. However, one of them states that DL_PermBase = 0 in the first zone, the other says DL_PermBase = IDcell in the first zone.

2. Proposed solutions

The forcing of DL_PermBase = 0 ensures that the first zone of PUSC, all the different sectors from different cells are orthogonal. However, IDcell shall be used in the subcarrier permutation equation to have different permutations in the first zone for different cells, where the IDcell values can be chosen differently. By adding the conditions to the renumbering and permutation formulas, DL_PermBase = 0 is no longer required. The standard text will be clean.

3. Specific text changes

[Modify the following text to section **8.4.6.1.2.1.1 Downlink subchannels subcarrier allocation in PUSC**]

=== Start text changes ====

1)

2) Renumbering the physical clusters into logical clusters using the following formula:

~~*LogicalCluster = RenumberingSequence((PhysicalCluster + 13*IDcellDL_PermBase) mod 120)*~~

$$\text{LogicalCluster} = \begin{cases} \text{RenumberingSequence}(\text{PhysicalCluster}) & \text{First DL Zone or "All SC Indicator = 0" in STC\_DL\_Zone\_IE(} \\ \text{RenumberingSequence}((\text{PhysicalCluster} + 13 * \text{DL\_PermBase}) \bmod 120) & \text{Otherwise} \end{cases}$$

In the first PUSC zone of the downlink (first downlink zone), the default ~~used IDcell is 0~~ renumbering sequence is used for logical cluster definition. For all other zones DL_PermBase parameter in the STC_DL_Zone_IE() shall be used. ~~In the first PUSC zone of the downlink (first downlink zone) the default used DL_PermBase is 0. When the 'Use all SC indicator=0' in the STC_DL_Zone_IE(), DL_PermBase is replaced with 0. For All other cases DL_PermBase parameter in the STC_DL_Zone_IE() shall be used.~~

3)

4) …. subcarriers in each symbol. Note that IDcell ~~used for the first PUSC zone is 0.~~ is used for the first PUSC zone in Equation (111). 0therwise the DL_PermBase parameter in the STC_DL_Zone_IE() shall be used in the equation.

[Modify the following text to section **8.4.6.1.2.2.2 Partitioning of data subcarriers into subchannels in downlink FUSC**]

Replace Equation (111) with the following equation:

$$\text{subcarrier}(k,s) = \begin{cases} N_{\text{subchannels}}\, n_k + \{p_s\,[n_k \bmod N_{\text{subchannels}}] + IDcell\} \bmod N_{\text{subchannels}} & \text{First DL Zone} \\ N_{\text{subchannels}}\, n_k + \{p_s\,[n_k \bmod N_{\text{subchannels}}] + DL\_PermBase\} \bmod N_{\text{subchannels}} & \text{Otherwise} \end{cases}$$

[Modify the following text]

8.4.5.3.4 Transmit diversity (TD)Space-Time Coding (STC)/DL_Zone switch IE format

In the DL-MAP, a BS may transmit DIUC = 15 with the TDSTC_DL_ZONE_IE() to indicate that the subsequent allocations shall use a specific permutation, or be transmit diversitySTC encoded. The downlink frame shall start in PUSC mode with ~~IDcellDL_PermBase = 0 and~~ no transmit diversity. Allocations

[Replace Figure 219 with the following figure:]

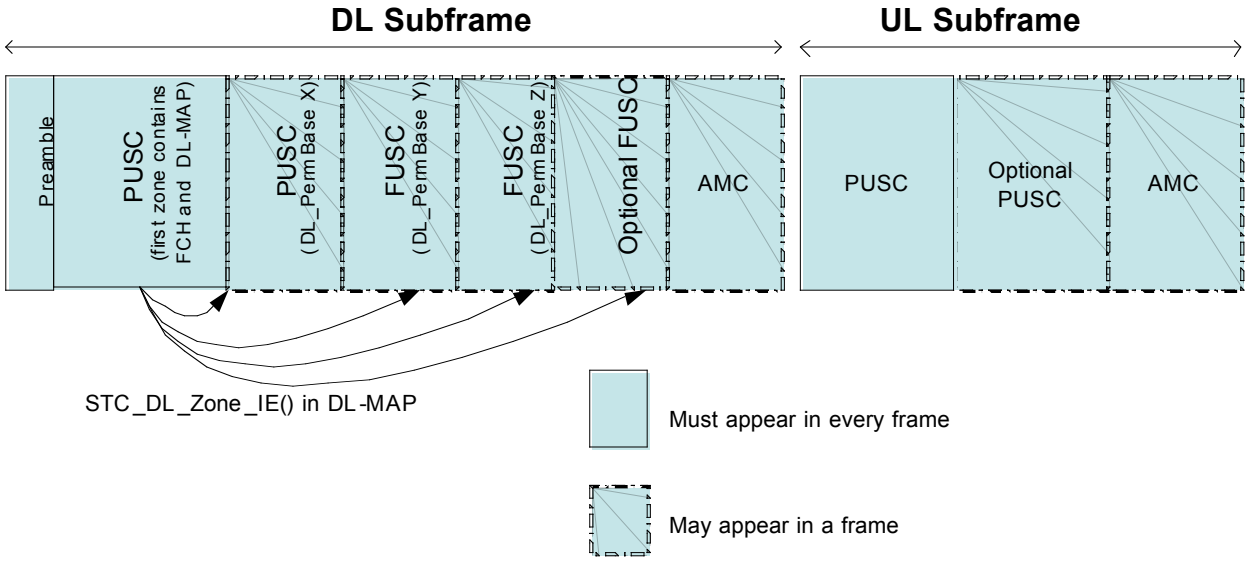

Figure 219-Illustration of OFDMA frame with multiple zones

=== End text changes ====

4. References

[1] IEEE 802.16-2004
[2] P80216_Cor1_D2