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| Title | **Clarifications for allocations in a DL STC zone with dedicated pilots** |
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| Source(s) | Dave Pechner, Arvind Raghavan<br>ArrayComm, LLC<br>dpechner@arraycomm.com, arvind@arraycomm.com |
| Re: | Call for comments to Cor2/D1 |
| Abstract | This document describes clarifications required for correct operation of allocations in STC zones with dedicated pilots |
| Purpose | Approve and adopt in Cor2 |
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# Clarifications for allocations in a DL STC zone with dedicated pilots

*Dave Pechner, Arvind Raghavan*
*ArrayComm, LLC.*
*Vincent Wolff*
*Beceem Communications*
*Hassan Yaghoobi, Eilon Riess*
*Intel*

## Problem Statement

In a zone with dedicated pilots, only the boundaries of associated pilots in frequency domain are defined (e.g. major group in PUSC, subchannel in AMC) and the boundaries in time domain are not defined. This doesn't generate a problem in PUSC and AMC, since the slot duration equals the pilot period, however it generates a problem in DL STC zones with PUSC, AMC and OFUSC permutations. In each case, the pilot pattern for STC is two slot durations. In these zones, if a BS allocates a burst spanning only two symbols (one slot-duration) in time, there are not enough pilots associated with the burst for channel estimation.

A clarification is needed to ensure that the minimum time duration of an allocation in a DL STC zone with dedicated pilots is two slots.

In addition, two SBC TLV's are added to indicate if a MS supports concurrent allocations in a DL STC zone with dedicated pilots and the allocation granularity a MS supports in a DL STC zone with dedicated pilots.

## Suggested Remedy

**8.4.5.3.4 Space-Time Coding (STC)/DL_Zone switch IE format**

***[Add the following underlined text at the end of the 2nd paragraph after "Dedicated pilots" header, on p.218 in 802.16-2004/Cor2/D2]***

For the PUSC permutation, the pilot symbols belonging to a major group must be precoded/beamformed along with all of the data allocations made within the major group. For the FUSC or Optional FUSC permutation, all of the pilot symbols and data subcarriers within an OFDM symbol shall be precoded/beamformed. The

minimum time duration of any allocation in a DL STC zone with dedicated pilots is two slot durations.

***[Add the following underlined text in the table for TLV 176 on page 395 in 802.164/Cor2/D2]***

Bit #20 – Allocation granularity in a DL PUSC STC zone with dedicated pilots
Bit #21 – Concurrent allocation support in a DL PUSC STC zone with dedicated pilots
Bit #2~~0~~2-23 - reserved

***[Add the following underlined text after the table for TLV 176 on page 395 in 802.164/Cor2/D2]***

If bit #20 is set to 1, the allocations for an MS in a DL PUSC STC zone with dedicated pilots must meet the following constraints, applicable to both non-HARQ and HARQ sub-bursts:

1. The allocation must be a rectangle.
2. The smallest OFDMA symbol number of the allocation must be a multiple of two slot-durations (4 symbols) relative to the smallest OFDMA symbol number of the zone.
3. The time duration of the allocation must be a multiple of two slot-durations (4 symbols).

If bit #20 is set to 0, it indicates that the MS supports a granularity of one slot-duration (2 symbols for DL PUSC) for an allocation in any DL STC zone with dedicated pilots so long as the allocation is larger than the minimum allocation duration of two slot-durations (4 symbols for DL PUSC).

If bit #21 is set to 1, no two allocations for the MS may occupy the same slot duration (2 symbols) in a DL PUSC STC zone with dedicated pilots. If bit #21 is set to 0, the MS can support multiple allocations in a given slot duration in any DL STC zone with dedicated pilots.