Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Clarification on Uplink PUSC Subcarrier Allocation for different FFT sizes**
Date Submitted	**2005-06-08**
Source(s)	Jungnam Yun, jnyun@posdata-usa.com Hwayong Joung, hyjoung@posdata.co.kr Jaehyeong Kim, jaekim@posdata-usa.com Yerang Hur, yehur@posdata-usa.com Bongho Kim, bhkim@posdata-usa.com POSDATA Co., Ltd.
Re:	IEEE P802.16e/D8.
Abstract	This presentation clarifies uplink PUSC subcarrier allocation for different FFT sizes.
Purpose	Review and adoption of the proposed text change into IEEE P802.16e/D8.
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.
Patent Policy and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

Clarification of Uplink PUSC Subcarrier Allocation for Different FFT Sizes

Jungnam Yun, Hwayong Joung, Jaehyeong Kim, Yerang Hur, Bongho Kim
POSDATA Co., Ltd.

1. Problem Statements

Parameters and values are different for different FFT sizes. However descriptions on applying the tile permutation for different FFT sizes have not been described in IEEE P802.16e/D8 appropriately. This contribution clarifies how uplink PUSC subcarrier allocation should be described for different FFT sizes.

2. Remedy

[Change 8.4.6.2.2 as follows:]

The allocated frequency band shall be divided into ~~420~~N_{tile} tiles and~~,~~ the allocation of tiles to subchannels is performed in the following manner:

1. Divide the ~~420~~N_{tile} tiles into six groups, containing ~~70~~$N_{tile}/6$ adjacent tiles each.
2. Choose six tiles per subchannel using Equation (113); for an example refer to 8.4.6.2.3.

~~$Tiles(s,n) \quad 70 \quad n \quad (Pt[(s \quad n) \bmod 70] \quad UL\_IDcell) \bmod 70$~~ ~~(113)~~

$Tiles(s,n) \quad N_{tile}/6 \quad n \quad (Pt[(s \quad n) \bmod N_{tile}/6] \quad UL\_IDcell) \bmod N_{tile}/6$ (113)

where
n is the tile index 0…5
Pt is the tile permutation
s is the subchannel number
N_{tile} is the number of tiles in a symbol
UL_IDcell is an integer value in the range 0…~~69~~$N_{tile}/6-1$, which is set by the MAC layer.

3. References

[1] IEEE Std 802.16-2004, “IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems,” Oct. 2004.

[2] IEEE P802.16e/D8, “Draft Amendment to IEEE Standard for Local and Metropolitan Area Networks Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems —Amendment for Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands,” May 2005.