

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >
Title	Concurrent UL Burst limitation
Date Submitted	<b>2004-06-26</b>
Source(s)	Yigal Eliaspur , Intel  <a href="mailto:yigal.eliaspur@intel.com">yigal.eliaspur@intel.com</a>  Voice: +972-547-884877  Yuval Lomnitz, Envara at Intel  <a href="mailto:yuvall@envara.com">yuvall@envara.com</a>
Re:	IEEE P802.16e/D32004
Abstract	Concurrent UL Burst limitation per MSS
Purpose	The document proposes to specify a limit to the number of UL concurrent burst supported by an MSS.
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 < <a href="http://ieee802.org/16/ipr/patents/policy.html">http://ieee802.org/16/ipr/patents/policy.html</a> >, 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 < <a href="mailto:chair@wirelessman.org">mailto:chair@wirelessman.org</a> > 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 < <a href="http://ieee802.org/16/ipr/patents/notices">http://ieee802.org/16/ipr/patents/notices</a> >.

# Concurrent UL Burst limitation per MSS

*Yigal Eliaspur*

*Yuval Lomnitz*

## 1. Motivation

There is no parameter today which limits the maximum number of concurrent bursts needed to be supported by the MSS in the UL-MAP allocation of OFDMA. Regulating the number of concurrent bursts is necessary for reducing implementation resources like processing power, memory etc. This also enables architectural and implementation flexibility for target multiple device configurations.

## 2. Details

The syntax of today's OFDMA UL data allocation is unidirectional burst allocation in time first manner. In such allocation technique, it's more than reasonable to allocate single region of burst for all the data needs of a single MSS, reasons are:

1. The UL allocations are unicast only and identified only by the basic CID
2. In the UL due to the one-dimensional data allocations, the scheduling complexity of the DL doesn't exist. Therefore, from efficiency reasons the BS should concatenate all data allocations to one SS in one UL burst.
3. Concurrent UL allocations may create transmission power variance, which degrades the system efficiency, whereas the transmission power variance in a single data allocation is bounded by 3dB.

In addition to the data allocation procedure which described above there are other control based allocation in the UL sub-frame:

1. Feedback channel (including CQI)
2. CDMA contention based Ranging & BW Request
3. HARQ feedback

Contention based ranging and/or BW requests are not being used by the MSS when explicit unicast data grant allocation is available: according to the spec the MSS does not need to perform ranging while it sends data (the BS can correct the MSS based on the data received). In addition, BW request can be sent in piggybacking technique on the data header itself (again without using the contention area).

We propose a constant limitation of 2 concurrent bursts -1 for data allocation and 1 for control (feedback channel). This limitation is not applied on HARQ allocations, in which remains as before unlimited.

## 3. Changes summary:

### 8.4.4.5 Uplink transmission allocations

*[Insert the following rows at the end of the section]*

In the uplink, the BS shall not allocate to any SS more than one UL PHY data burst in a single frame. This limitation does not apply to H-ARQ data allocation regions.