

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Concurrent UL Burst Capability in OFDMA PHY	
Date Submitted	2004-05-17	
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Re:	IEEE P802.16e/D2-2004	
Abstract	Concurrent UL Burst Capability in OFDMA	
Purpose	The purpose of this document is to specify a fix number of UL OFDMA concurrent bursts supported by the SS and the guard time requirements between subsequent SS bursts.	
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Concurrent UL Burst Capability in OFDMA

Yigal Eliaaspur

Motivation:

The standard doesn't specify any limitations on the UL allocations, and we view this contribution as a clarification to the standard. We propose not to permit concurrent UL allocations, and to require a gap of 1 OFDMA symbol between two UL allocations of the same SS.

1. The UL concurrency limitation simplifies the PHY implementation in the following perspective:
 - a. It doesn't concurrently modulate several bursts.
 - b. Concurrent transmission requires the transmitter to plan ahead the power allocations, so that it doesn't run out of PA power when additional tones need to be added to the modulation, which is difficult to implement as well as inefficient.
2. The gap between two successive (time) UL allocations is required in order to ramp down one UL burst before starting the ramp-up of the next burst. Different bursts may require different transmission power, and therefore switching of analog circuits may be required, which cannot be performed during active transmission.
3. Allocation efficiency in the uplink is not affected, because the BS can aggregate all bandwidth allocations of the same SS to a single burst. In a normal system, UL Bursts from the same SS are expected to have the same burst profile, although formally, the BS may allocate different burst profiles for different bursts. It is expected that UL burst profile will be determined based on the link quality, as defined in the standard for DL burst profile (DBPC-REQ or RNG-REQ, see 6.3.10.1).
4. Note that concurrent allocations are not efficient in terms of transmission power, since in a PA-power limited scenario (edge of cell) the transmitted power is constant, and power spectral density (power/tone) is scaled by the number of tones.

Details:

Add the following sentence to the spec:

In the uplink, the BS shall not allocate to any SS more than one UL PHY bursts in a single frame that shared the same OFDMA symbol. In the case that more than one UL burst is allocated to the same SS in an OFDMA frame, a gap of at least one OFDMA symbol shall be kept between the allocations.

Changes summary:

8.4.4.6 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 bursts in a single frame that shared the same OFDMA symbol. In the case that more than one UL burst is allocated to the same SS in an OFDMA frame, a gap of at least one OFDMA symbol shall be kept between the allocations.