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Title	Details of SDD Section 11.9.2.5 Bandwidth Request Channel
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Re:	SDD Session 56 Cleanup, Call for PHY Details
Abstract	This is revised version of Section 11.6 of IEEE 802.16m-08/003r4. This document provides further physical layer details.
Purpose	Draft for further development of the IEEE 802.16m SDD
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Details of SDD Section 11.9.2.5 Bandwidth Request Channel

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11.9.2.5 Bandwidth Request Channel

Contention based or non-contention based random access is used to transmit a bandwidth request indicator on this control channel. To support different levels of QoS, the bandwidth request channel provides a mechanism for prioritized bandwidth requests for contention based random access.

Deleted: Inclusion of addition information in a bandwidth request indicator such as bandwidth request size, MS-ID, flow identifier, uplink transmit power report and CINR report is FFS.

The random access bandwidth request procedure is described in Figure 1. A 5-step regular procedure (step 1 to 5) or an optional quick access procedure (step 1,4 and 5) may be supported concurrently. Step 2 and 3 are used only in 5-step regular procedure. In step 1, MS sends a bandwidth request indicator that may indicate bandwidth request from MS, and the BS may allocate uplink grant based on certain policy. The 5-step regular procedure is used independently or as fallback mode for quick access procedure. The MS may piggyback additional BW-REQ information along with user data during uplink transmission (step 5).

Deleted: information such as MS addressing and/or request size (FFS) and/or uplink transmit power report (FFS)

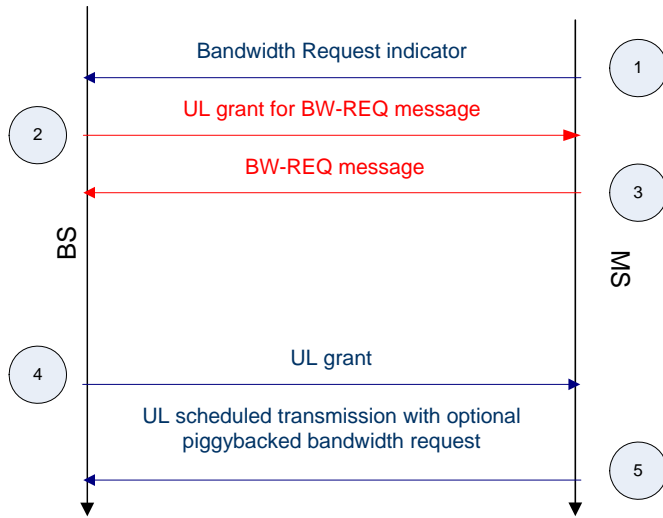


Figure 1 Bandwidth Request Procedure

11.9.2.5.1 Multiplexing with other control channels and data channels

The bandwidth request channel starts at a configurable location with the configuration defined in a DL broadcast control message. Non-contention based bandwidth request channels are allocated periodically for MS. The bandwidth request channel is FDM with other UL control and data channels.

Deleted: The structure of bandwidth request channel resource blocks, pilots and resource mapping are TBD.

11.9.2.5.2 PHY structure

For contention based bandwidth request channels, the sequence design and mapping to subcarriers are TBD.

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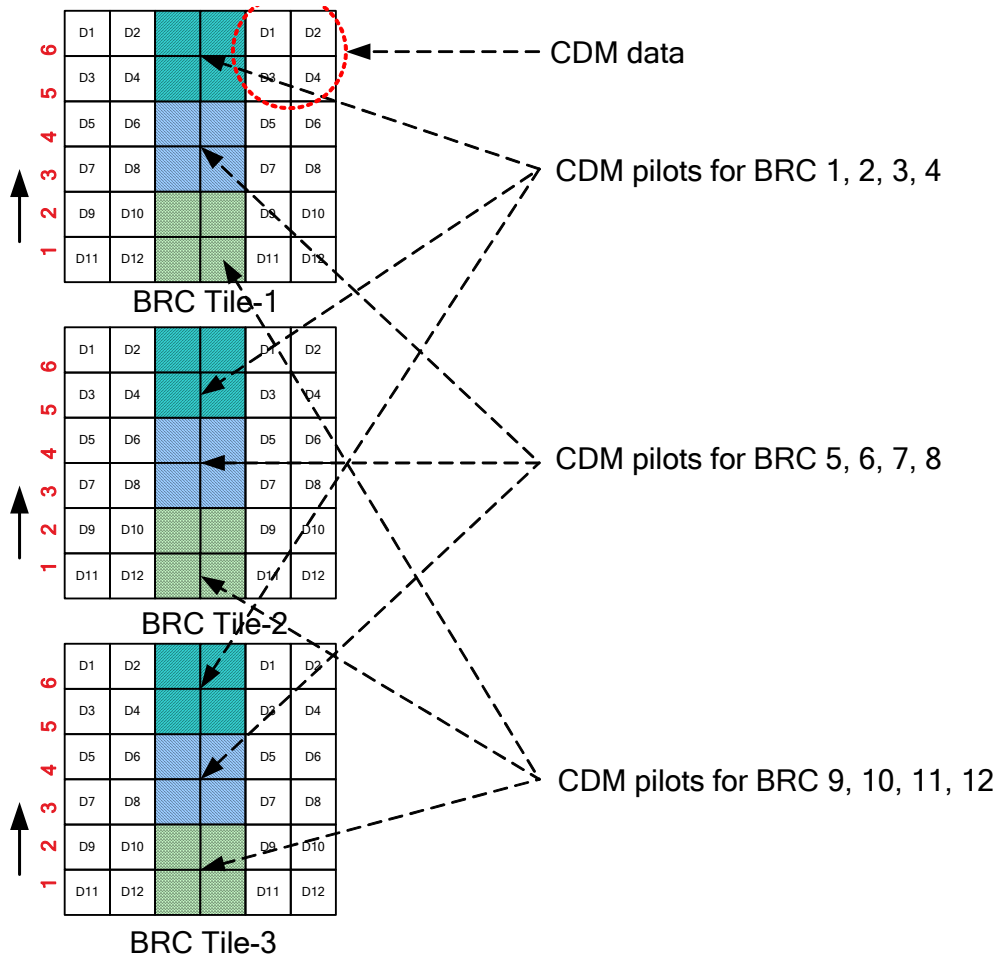
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1 The sequence can be configured per user class, per service class and per sector. Users can be classified based on
2 operator-specific network performance requirements and service level agreements.

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3
4 For non-contention based bandwidth request channels, the channel physical structure is similar as UL HARQ
5 feedback channel with very low overhead. Non-contention based bandwidth request channel is BPSK
6 modulated. Its transmit power is adaptively adjusted to the fading channel according to UL power control.
7

8 For non-contention based bandwidth request channels, twelve UL bandwidth request channels are multiplexed
9 together using a mixture of FDM/TDM/CDM in three UL DRU tiles. For each group of four tones that are
10 adjacent in time and frequency, pilot and data symbols from four bandwidth request channels are CDMed
11 together in order to take full advantage of the MS transmit power. Further, since these four tones are adjacent
12 in time and frequency, orthogonal codes can be used to separate the four bandwidth request channels. Finally,
13 multiple groups of four tones are allocated in each tile with FDM/TDM. The pilot and data tone allocations are
14 shown in Figure 2.
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[Figure 2. Non-contention based bandwidth request channel pilot and data Tone allocations](#)

[In order to improve the coverage of bandwidth request channel for cell edge MSs, the bandwidth request tiles are allocated in time dimension first as shown in Figure 3. Further, subframe based frequency hopping of the tiles can be applied to improve the frequency diversity.](#)

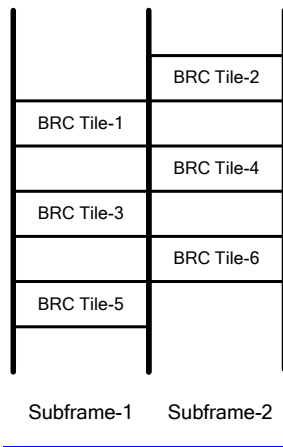


Figure 3. [Non-contention based bandwidth request tile allocations](#)

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