Proposal for IEEE 802.16m MS Assignment Index for Bitmap Overhead Reduction

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Re: "SDD Session 56 Cleanup, Call for PHY Details"; in response to the Call for Contributions and Comments on Project 802.16m System Description Document (SDD) 802.16m-08/033 for Session 57

Purpose: Adopt the proposal into the IEEE 802.16m System Description Document

Scope

- This contribution presents An MS assignment index which replaces an assignment bitmap in group messages
  - This contribution provides description on the MS assignment index only. Related contributions on group and control structure are:
    - IEEE C802.16m-08/176 - Control structure
    - IEEE C802.16m-08/177r1 - Group resource/ VoIP Control structure
    - IEEE C802.16m-08/1073 (or latest revision) - Group Resource Allocation and Control Structure

Introduction:
Group Assignment

- Group assignment is used to benefit large number of users
    - A group is signaled by a group bitmap.
    - Each location in the bitmap is assigned to a user. The value of the bit for each user indicates whether the user is being assigned resources ('1'), or not being assigned resources ('0').
    - The first indicated assignment is assigned to the first available resource(s), the second indicated assignment is assigned to the second available resource(s).

Group Assignment Bitmap   **CRC**

0 1 0 0 0 1 0 0 0 0 1 1 0 0 1 0 0 1 0 1 0 0 1 0 1

Indicated assignment '1'
Indicated assignment '2'
Indicated assignment '3'
Indicated assignment '4'
Indicated assignment '5'
Indicated assignment '6'
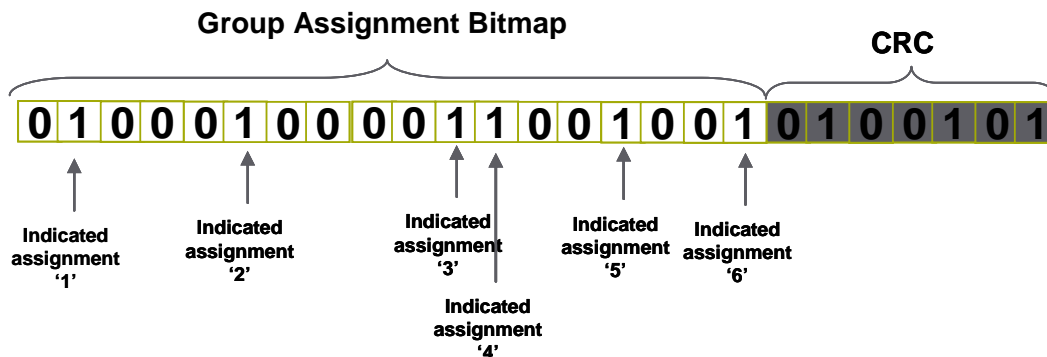
- Each group bitmap has its own set of resources (i.e. different resource segment)

MS Assignment index (1/2)

- To reduce overhead, we can replace the bitmap with codeword (or index) indicating which MSs have assignments.

- The index or codeword is generated from bitmap.

- The index corresponds to certain ordered assignments with a specific number of assignments.

- The index is sent instead of sending a bitmap to indicate assignments to a group of users.

- The receiver can use the index to determine the ordered assignments of the group.

MS Assignment index (2/2)

- The number bits needed to signal active and inactive assignments to users can be significantly reduced from the conventional bitmaps, by sending an MS assignment index.

Proposed Text for SDD

11.7.2.3.1.1 User non-specific control information

[Retain existing text in this section and add the following]

A resource availability bitmap (RAB) is used to be indicate which persistently assigned available resources are available to be assigned to other users.

11.7.2.3.1.2 User-specific control information.

[Retain existing text in this section and add the following]

The group message indicates an assignment bitmap and associated assignment fields. The group bitmap to assigned resources to MSs of the group. An MS assignment index can be transmitted instead of an group assignment bitmap to reduce signaling overhead. The group message can be configured to contain assignment fields. Possible fields include supplemental transmission information, resource permutation index, and MS set/ordering index. Group message for UL assignment include a UL resource/partition index.