Project	**IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>**
Title	**802.16m Frame structure for enhanced STC support**
Date Submitted	**2008-03 -17**
Source(s)	Mariana Goldhamer E-mail: mariana.goldhamer@alvarion.com Alvarion ltd. 21A, Ha Barzel Street Tel Aviv
Re:	16m Frame Rap. Group - Call for Comments
Abstract	Proposed 802.16m Frame Structure for better STC support
Purpose	Actions: 1. Modification of ToC 2. Capture of the text in the SDD
Notice	*This document does not represent the agreed views of the IEEE 802.16 Working Group or any of its subgroups*. It represents only the views of the participants listed in the "Source(s)" field above. It is offered as a basis for discussion. It is not binding on the contributor(s), who 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	The contributor is familiar with the IEEE-SA Patent Policy and Procedures: <http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and <http://standards.ieee.org/guides/opman/sect6.html#6.3>. Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and <http://standards.ieee.org/board/pat>.

802.16m Frame structure for better STC support

Mariana Goldhamer
Alvarion Ltd.

Introduction

The current 802.16 Frame structure transmits the Frame control information contained in FCH and MAPs with no-STC support. On the other hand, different SSs may need different STC schemes for optimum spectral efficiency performance. The limitation of the FCH and MAP transmission has a big impact on the SRC performance regarding the coverage and data rates.

The contribution IEEE C802.16m/08-038r1 provided a number of schemes for improving the STC support. However, based on the feedback contained in the Frame Rapporteur Group document C802.16m/08-096r10, resulted the need of a better explanation and also the incorporation of some changes proposed by Runcom.

This contribution is more focused towards the STC support. The general approach is aligned with the sub-frame and SET (enhanced major group) concepts. The control and data information is transmitted across the 802.16m Frame Zones by using the optimal STC mode.

The contribution introduces the concept of E-Zone (enhanced ZONE); according to this concept both the permutation and STC modes are main attributes which can differentiate between E-Zones.

From here insert text for SDD

11.4.4   Cell Coverage Support in Frame Structure

11.4.4.x STC Support in Frame Structure

The STC mode has a big influence on the spectral efficiency and cell coverage. Different STC modes could be suitable to different SS positions and mobility targets.

One of the main differentiation factors between the STC modes is the pre-coding Matrix type: A, B, C. Different Matrixes are suitable to different SSs, function of their experienced SINR and mobile behavior. The 802.16m Frame structure defines the Enhanced Zones (E-Zones), which are characterized by both permutation type and STC type. These E-Zones can start from the beginning of the Frame and carry their own MCH (MAP Control Header) and MAP.

Each of the main downlink SETs (major group enhancements), namely the Master SET, Reuse 1 Control/Data SET and the E-MBS SET, will start with three MCHs transmitted at predefined positions within the Frame and using a predefined STC mode.

Each MCH may point to one or more E-Zones, preferably using the same STC mode. The pointed to E-ZONE

may be located in the same or a different SET.

Fig. xx indicate the Frame structure including E-Zones, using for example the Reuse 1 Control/Data SET. The E-ZONEs 1, 2 and 3 use the same permutation as the E-MBS Zone, while the E-ZONEs 4, 5 and 6 use a different permutation. The MCH using the STC mode 1 points to the E-Zone 6 using the same STC mode but a different permutation.

The E-Zone can be allocated with the same allocation resolution used for sub-frames.
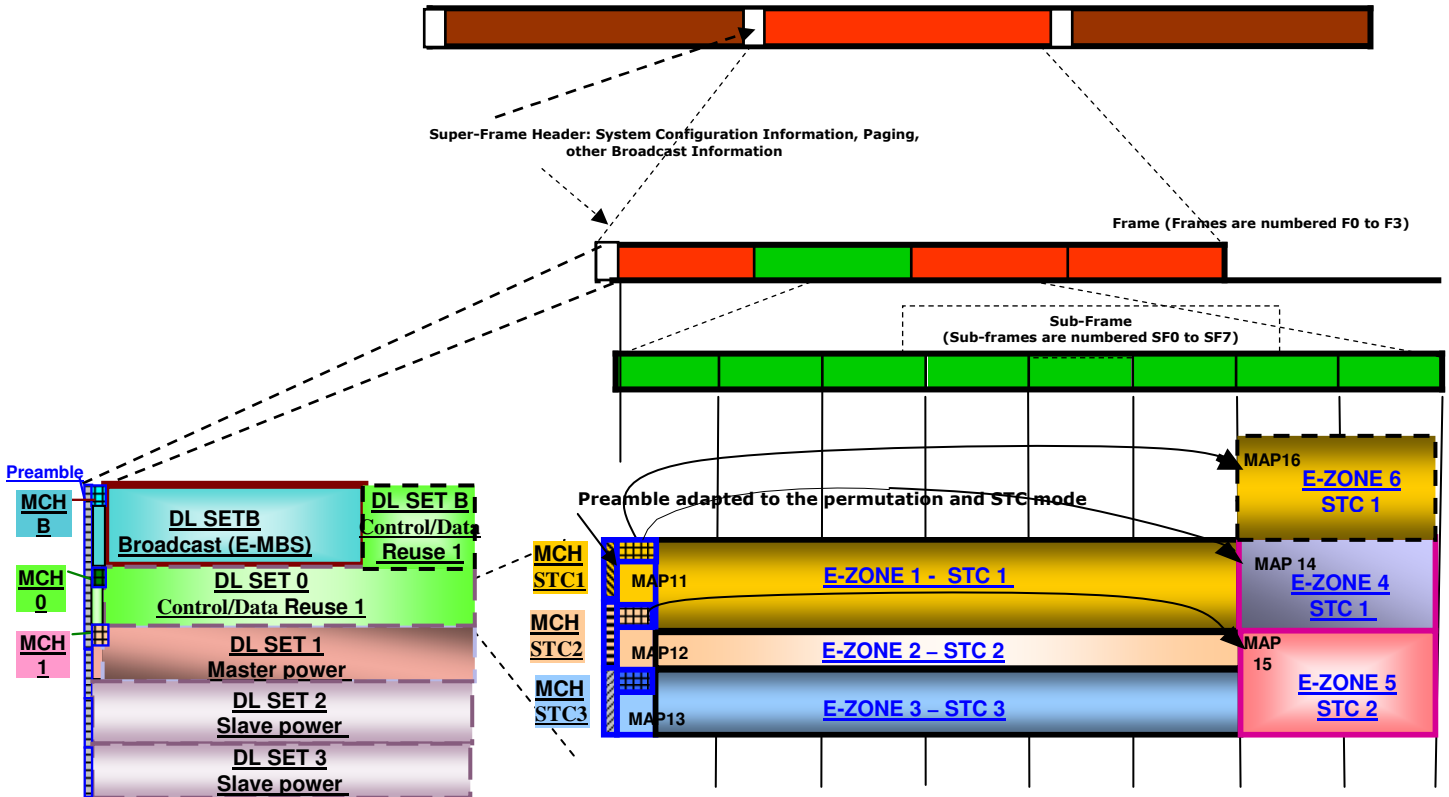

Fig. xx: Example of down-link E-Zones using Fixed MCH locations

The Master MCH can also point to an MCH not having a pre-defined well-known location in the OFDMA Frame. This mode is named "Linked MCH". A linked MCH may be located in the same or other SET, including the Slave SETs.

The rules governing the usage of Linked MCH are:
 – An MCH can only point to an MCH located in a future Frame;
 – Linkage chain is reset at the start of the Multi-frame;
 – Pointed to MCH can be transmitted with the same or with a different permutation;
 – Pointed to MCH can be located in another SET and can use a different Tx power density.

An example is shown in fig. yy. In this example the MCH using the STC mode 1 is pointing to a MCH located in a Slave SET and using the same STC mode. In turn, this MCH is pointing to the next one.
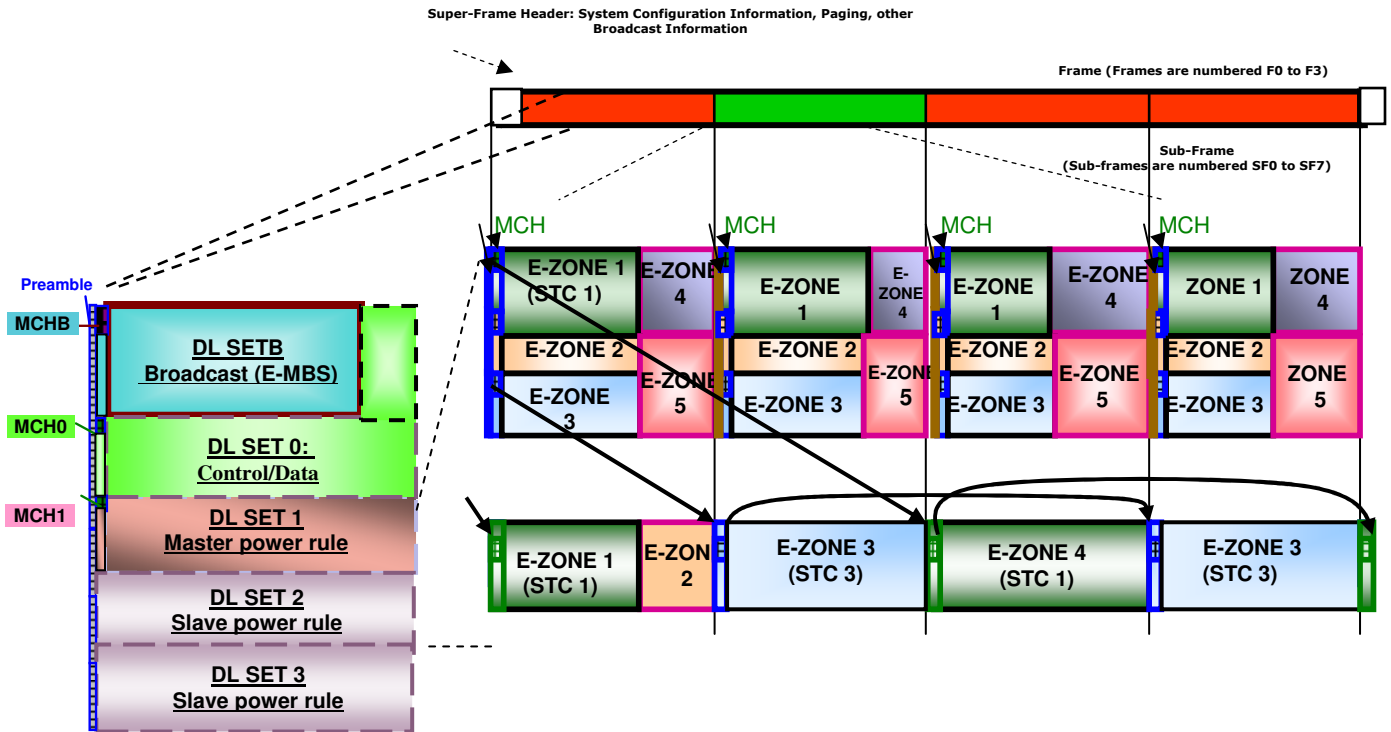
Fig. yy: Example of down-link E-Zones using linked MCH locations

End text insertion