| | |
|---|---|
| Project | **IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16> |
| Title | **Control channel structure for multicarrier system** |
| Date Submitted | **2008-03-10** |
| Source(s) | Adrian Boariu, Shashi Maheshwari, Yousuf Saifullah, Peter Wang<br>Nokia Siemens Networks<br>adrian.boariu@nsn.com<br><br>Zexian Li<br>Nokia<br>zexian.li@nokia.com |
| Re: | IEEE 802.16m-08/005 - Call for Contributions on Project 802.16m System Description Document: Downlink Control Structures |
| Abstract | A control structure proposal for multicarrier system. |
| Purpose | To incorporate the proposals into the 802.16m 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:<br><http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and<br><http://standards.ieee.org/guides/opman/sect6.html#6.3>.<br>Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and <http://standards.ieee.org/board/pat>. |

# Control Channel Structure for Multicarrier System

*Adrian Boariu, et al.*
*NSN, et al.*

## Introduction

This contribution is proposing a control channel for multicarrier systems. We are also discussing about the types of mobile stations (MSs) that 16m should support, because this drives the control channel for multicarrier.

## Supported types on MSs

It is important to agree on the capabilities of the MS when the multicarrier control channel is discussed.

In order to allow the manufactures to build terminals with a wide range of capabilities we are proposing the following types of MSs to be supported by the 16m:

1. Type 1 is a standard MS that operates in a single carrier only; may be capable of supporting different nominal channel bandwidths but cannot perform intercarrier handover.
2. Type 2 MS that can perform intercarrier handover and supports at least two nominal channel bandwidths, but operates in a single carrier at a time. This type of MS has agility to change fast the carriers as well as operating in wider bandwidths. It may be very appealing from the capability perspective.
3. Type 3 MS can operate simultaneously at least on two *adjacent* carrier bands, and it supports Type 2 operation. The level of complexity of this MS is increased.
4. Type 4 MS can operate simultaneously with at least two *non-adjacent* carrier bands. This is the most flexible and complex MS with respect to supported capabilities. This type of MS may be appealing to service providers that do not have contiguous spectrum available while still desiring to provide superior service to the end user.

## Control channel for multicarrier

If it is agreed to support the above-mentioned types of MSs, than the control channel should be very flexible. We are proposing to transmit the resource allocation information in every enabled carrier. This allows the system to reduce the delay in delivering the control information, allows good load balancing especially when Types 3 and 4 MSs are available in the system, and it offers high flexibility of the system.

## Proposed Text

*[Insert the following definition in section 3]*

**Type 1 MS:** A mobile station that operates in a single carrier only and may be capable of supporting different nominal channel bandwidths.

**Type 2 MS:** A mobile station that can perform intercarrier handover and supports at least two nominal channel bandwidths, but operates in a single carrier at a time.

**Type 3 MS:** A mobile station that supports Type 2 MS and in addition it can operate simultaneously at least

on two *adjacent* carrier bands.

**Type 4 MS:** A mobile station that supports Type 3 MS and in addition it can operate simultaneously at least on two *non-adjacent* carrier bands.

*[Insert the following section]*

**11.x Control channel structure for multicarrier and wider channel bandwidth modes of operation**

The resource allocation information should be transmitted in every enabled carrier of a system that operates in multicarrier and/or wider channel bandwidth modes.