Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Request for AAS Enhancement Project**
Date Submitted	**2006-09-27**
Source(s)	Michael Webb Dale Branlund BRN Phoenix Inc. 2500 Augustine Drive Santa Clara, CA 95054 Voice: (408) 572-9706 Fax: (408) 351-4911 [mailto: mwebb@brnphoenix.com]
Re:	Call For Contributions for Consideration by 802.16 Project Planning Committee, 9/25/06
Abstract	This contribution requests the 802.16 Project Planning Committee to consider incorporating enhancements to 802.16 Adaptive Antenna Systems (AAS) techniques in a future project.
Purpose	This document is submitted in response to a Call for Contributions for future standards projects for consideration by the 802.16 Project Planning Committee.
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Request for Consideration by 802.16 Project Planning Committee of Future AAS Enhancement Project

Michael Webb
Dale Branlund
BRN Phoenix

Abstract

This contribution requests the 802.16 Project Planning Committee to consider incorporating enhancements to 802.16 Adaptive Antenna Systems (AAS) techniques in a future project.

Background

IEEE 802.16-2004 describes two framing structures for AAS mode – the Diversity Map Scan and Direct Signaling Method, described in sections 8.4.4.6 and 8.4.4.7 respectively. In 802.16-2005, the Direct Signaling Method is deleted from the text.

Need for an AAS Enhancement Project

Both AAS methods are intended to provide improvements to 802.16 OFDMA system coverage and capacity performance through the use of multi-antenna beamforming to create independent spatial channels within an 802.16 cell (also known as SDMA – Space Division Multiple Access).

However, neither AAS method has undergone an objective or exhaustive assessment of performance nor been the subject of evaluation or assessment by an authorized 802.16 Task Group. Also, both methods were defined in early 2004, prior to formal ratification of 802.16-2004 and well in advance of subsequent work in 802.16 and WiMAX Forum on the OFDMA PHY and the Mobile WiMAX standard and certification profiles. Moreover, recent advancements in adaptive antenna processing techniques and underlying signal processing technologies are not necessarily considered in the current 802.16 AAS mode.

As 802.16 systems become widely deployed around the globe, network operators will require levels of spectral efficiency significantly higher than that enabled by baseline OFDMA modes. Specifically, spectral efficiency in the range of 5-10 bps/second/Hz/cell will be needed to achieve the subscriber penetration rates needed to ensure commercial success for these networks, given the bandwidth-intensive multimedia services they must support. Similar levels of spectral efficiency will be needed to achieve the goals established by the ITU for IMT-Advanced and by 3GPP for 3G LTE PHY.

While the existing AAS mode does provide improved coverage and capacity versus non-AAS systems, it is our view that newer AAS techniques are now available that can provide an order-of-magnitude improvement in spectral efficiency and capacity relative to baseline 802.16 OFDMA PHY modes.

For these reasons, the 802.16 WG (via the Project Coordination Committee) should consider the establishment of a new standards project to address enhancements to the AAS PHY mode or as a minimum, should explicitly incorporate a revision to the AAS mode within the scope of any project to address future air interface requirements, such as that being discussed for IMT-Advanced.