Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Proposal for clarifying the 802.16e PAR**
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Re:	802.16e Project Authorization Request (http://ieee802.org/16/docs/02/80216-02_48r4.pdf)
Abstract	This contribution proposes some clarifications to the 802.16e PAR to enable proper interpretation of the compatibility requirements between the IEEE 802.16-2004 Std and the amendment being developed in the 802.16e Project.
Purpose	Adopt the changes in this proposal to amend the current 16e PAR document
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Proposal for clarifying the 802.16e PAR

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Introduction

The current 802.16e project specified in [1] is intended to develop an amendment to the proposed IEEE Std 802.16-2004 for enabling combined fixed and mobile broadband wireless access systems. However there are some editorial and technical scope clarifications that are necessary for enabling more focused development of the 802.16e specifications. This contribution describes the items that need to be clarified and proposes text changes that could be adopted to modify the PAR appropriately.

Motivation

As the commercial interest in 802.16e based systems increases, it is also necessary that the standard be able to meet the needs of the market place. Presently channel bandwidth allocations in the different geographies for BWA are different. However today's mobile subscriber expects to travel with the same Mobile devices from place to place expect to receive BWA service. This essentially results in the need for mobile subscriber stations to support BWA in multiple channel widths ideally within a single physical layer mode.

Presently the 802.16REVd PAR [2] has been specified for fixed access, while the 802.16e PAR [1] has been specified to support combined fixed and mobile access. It is quite evident from the state of the 802.16-2004 specifications that the 16e project will need to define some physical layer enhancements for optimal operation in multiple channel widths for the OFDMA physical layer mode. However several limitations exist in interpreting the present 16e PAR to allow for such changes. So some clarifications are necessary for achieving these objectives.

Items needing clarification

1) The current PAR refers to the 802.16 and 802.16a standard, the more appropriate reference should be to the 802.16-2004 standard.
2) The lower limit of 2GHz has already been approved for removal from the proposed 802.16-2004 standard
3) The current explanatory notes in Item 18 do not clarify the exact nature of interoperability expected with 802.16-2004 systems (formerly 802.16a). This is especially constraining when physical layer enhancements like scaled FFT sizes for supporting varied channel bandwidths are essential for combined fixed and mobile operation worldwide.

PAR Clarifications Proposed

The current Item 12. "Scope of Proposed Project" states

"This document provides enhancements to IEEE Std 802.16/802.16a to support subscriber stations moving at vehicular speeds and thereby specifies a system for combined fixed and mobile broadband wireless access.

Functions to support higher layer handoff between base stations or sectors are specified. Operation is limited to licensed bands suitable for mobility between 2 and 6 GHz. Fixed 802.16a subscriber capabilities shall not be compromised (See Item #18).”

Changes suggested:

1. Change “802.16a” to “802.16-2004”
2. Change third sentence to “Operation is limited to licensed bands suitable for mobility below 6 GHz”.

The Item 18 “Additional Explanatory Notes: (Item Number and Explanation)” states

“Item #12 - Subscriber stations specified herein, when stationary, shall interoperate with base stations specified in IEEE Std 802.16a. Base stations specified herein shall interoperate with stationary subscriber stations specified in IEEE Std 802.16a. Because the standard will utilize the 802.16/802.16a medium access control layer, it will support multimedia services requiring differentiated Quality of Service, and it will support adaptive physical link control so that subscriber stations can receive higher-rate service when they move more slowly, include more effective antennas, or are otherwise in better link conditions.”

Changes suggested:

1. Modify first sentence to “Subscriber stations specified herein, when stationary shall interoperate with base stations specified in 802.16-2004 that use the same physical layer mode (SC, OFDM, OFDMA)”.
2. Modify second sentence to “Base stations specified herein shall interoperate with stationary subscriber stations specified in IEEE Std 802.16-2004 that use the same physical layer mode (SC, OFDM or OFDMA)”.
3. Insert new third sentence.

   Option 1: “Subscriber stations specified herein shall implement at least one of the physical layer modes specified in IEEE Std 802.16-2004 or at least one of the additional scaled FFT size extensions to the same mode.”

   Option 2: “Subscriber stations specified herein shall implement at least one of the physical layer modes specified in IEEE Std 802.16-2004 or at least one of the additional scaled FFT size extensions to the OFDMA physical layer mode.”

4. Replace “802.16a” with “802.16-2004” in last sentence.

Recommendation

This contribution proposes some revisions to the existing 802.16e PAR. The recommendation is for the 802.16 WG to adopt the changes suggested and approve preparation of a PAR revision submission based on these changes.

References

[1] IEEE SA Project Authorization Request (PAR) 802.16e (http://ieee802.org/16/docs/02/80216-02_48r4.pdf)

[2] IEEE SA Project Authorization Request (PAR) 802.16REVd
(http://standards.ieee.org/board/nes/projects/802-16-REVd.pdf)