

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >
Title	Proposed edits to Draft P802.16m Requirements (C802.16m-07/076r2) regarding Backward Compatibility and Profiles
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Re:	IEEE 802.16m-07/008r2 (<i>Call for Comments on Project 802.16m Requirements</i>)
Abstract	This contribution proposes text in support of comment to clarify the backward compatibility requirements in P802.16m by detailing a profiling process.
Purpose	For consideration by IEEE 802.1's Task Group m and incorporation in the P802.16m Requirements.
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Proposed edits to Draft P802.16m Requirements (C802.16m-07/076r2) regarding Backward Compatibility and Profiles

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Abstract

This contribution proposes text in support of comment to clarify the backward compatibility requirements in P802.16m by detailing a profiling process.

Comment

Much of the language in the Document under Review (C802.16m-07/076r2) exists solely to clarify the backward compatibility (“legacy support”) requirement of the new P802.16m amendment. Much of this language is inherently faulty, awkward, inaccurate, or ambiguous. The problem, at its core, is that the standard does not include complete compliance profiles providing for interoperability. Without such profiles, it is impossible to discuss backward compatibility. The Document under Review tries to address this situation by introducing a fictional “reference system” referring to a private document outside the standard. This is a patchwork approach that cannot address the issue correctly and will lead to further complication as the standard develops.

For example, the Document under Review talks at length about “802.16e” systems and devices. This is a fundamentally erroneous way to describe a system. IEEE 802.16e is not a complete standard; it is simply an amendment to a standard. The content introduced in 802.16e can be changed by amendments and corrigenda.

Soon, 802.16e will itself be obsolete, as a revision will wipe it away. So “802.16e” is the wrong language to use to refer to content introduced in IEEE Std 802.16e. And, while the Document under review tries to introduce an external reference to patch up that problem, it also talks at length about “802.16m” systems, which just reintroduces the whole problem all over again!

Without coming to grips with the issue of profiles, the standard is completely unable to address even the simplest questions about compliance. For example, let’s assume that systems are currently deployed in compliance to the standard up through 802.16e. Now, let’s assume that the standard is amended by 802.16m, with features added. Then we ask the question: Is the deployed system still compliant to the standard? Since it lacks the new features, it is apparently no longer compliant. However, if we include a compliance profile to record the features of the standard applicable to the 802.16e-vintage system, and if we maintain that profile in the advanced standard, then it is possible to claim continued compliance to *that profile*.

Another critical problem is that the private profile document referenced in the Document under Review is limited to a specific application case; e.g. TDD and 5/10 MHz. So consider the impact of a statement like that on Page 9, Line 18: “An IEEE 802.16m base station shall support... operation of IEEE 802.16e mobile stations with performance equivalent to an IEEE 802.16e base station.” This would require that the advanced system would operate *only* in TDD mode (or force the design of a BS to support TDD and FDD SSs simultaneously).

In order to address and solve this problem, the WG needs to aggressively take control of managing the process of maintaining and updating the standard within recordkeeping *internal to the standard*. This needs to be reflected in the activities of TGM. The standard needs to clearly identify and label (and date) its own compliance profiles. Those profiles must be updated along with maintenance changes and must be preserved, as standalone entities, when new advanced versions of the standard

come along. Otherwise it will be impossible to discuss compliance. Without compliance, it is impossible to talk coherently about backward compatibility.

This contribution suggests that the P802.16m Requirements need to reference a profile that reflects the preexisting status of IEEE Std 802.16. It proposes to name that profile the “WirelessMAN-OFDMA/2005” profile. The intent of that profile is to provide a compliance table for devices conformant to the WirelessMAN-OFDMA in IEEE Std 802.16, as it existed prior to 802.16m. The “2005” is simply a part of the name used to designate the profile; it is chosen as a reminder of its origins in 802.16e-2005. Since the profile does not currently exist, this contribution suggests that it be added to Clause 12 during the IEEE 802.16 revision project. The WirelessMAN-OFDMA/2005 profile would include several subprofiles, distinguished by duplex method (TDD or FDD) and FFT size. By default, each subprofile would specify all mandatory features currently embodied the standard, including maintenance changes. However, additional mandatory features could also be included.

Suggested Remedy

Replace Clause 1 (Overview) with the following:

The P802.16m draft shall be developed in accordance with the P802.16 project authorization request (PAR), as approved on 6 December 2007 <<http://standards.ieee.org/board/nes/projects/802-16m.pdf>>, and with the Five Criteria Statement in IEEE 802.16-06/055r3 <http://ieee802.org/16/docs/06/80216-06_055r3.pdf>.

According to the PAR, the standard shall be developed as an amendment to IEEE Std 802.16. The scope of the resulting standard shall fit within the following scope:
This standard amends the IEEE 802.16 WirelessMAN-OFDMA specification to provide an advanced air interface for operation in licensed bands. It meets the cellular layer requirements of IMT-Advanced next generation mobile networks. This amendment provides continuing support for legacy WirelessMAN-OFDMA equipment.

and the standard will address the following purpose:

The purpose of this standard is to provide performance improvements necessary to support future advanced services and applications, such as those described by the ITU in Report ITU-R M.2072.

The standard is intended to be a candidate for consideration in the IMT-Advanced evaluation process being conducted by the International Telecommunications Union – Radio Communications Sector (ITU-R).

This document represents the high-level system requirements for the P802.16m draft. All content included in any P802.16m draft shall meet these requirements. This document, however, shall be maintained and may evolve. If a proponent wishes to propose material for the P802.16m draft that is not in compliance with this document, the proponent is advised to first initiate a discussion on the revision of this requirements document.

These system requirements embodied herein are defined to ensure competitiveness of the evolved air interface with respect to other mobile broadband radio access technologies as well as to ensure support and satisfactory performance for emerging services and applications. These system requirements also call for significant gains and improvements relative to the preexisting IEEE 802.16 system that would justify the creation of the advanced air interface.

To accelerate the completion and evaluation of the standard, to improve the clarity and reduce complexity of the standard specification, and to further facilitate the deployment of new systems, the number of optional features shall be limited to a minimum.

Clause 2 (References)

on page 5, lines 25-26, delete Reference [1]:

Clause 3 (Definitions):

on page 5-6, delete all definitions of IEEE 802.16e Reference System, IEEE 802.16e Base Station, IEEE 802.16e Mobile Station, IEEE 802.16m Base Station, and IEEE 802.16m Mobile Station

Clause 3 (Definitions): add the following

- WirelessMAN-OFDMA/2005: A compliance profile to be added to Clause 12 during the 802.16 revision project begun in March 2007. This profile includes several subprofiles, distinguished by duplex method (TDD or FDD) and FFT size. By default, each subprofile would specify all mandatory features currently embodied the standard, including maintenance changes.
- WirelessMAN-OFDMA/2008: A profile to be added to Clause 12 during the 802.16m project. This profile will include several subprofiles, distinguished by duplex method (TDD or FDD) and FFT size. By default, each subprofile would specify all mandatory features currently embodied the standard, including maintenance changes. Each subprofile in the WirelessMAN-OFDMA/2008 profile shall require legacy support for the corresponding subprofile in WirelessMAN-OFDMA/2008; see Subclause 5.1 for details.

Replace Subclause 5.1 with the following:

Clause 12 of P802.16m shall specify a new profile, tentatively titled "WirelessMAN-OFDMA/2008." This profile shall include a number of subprofiles. Each unique combination of duplexing mode (TDD or FDD) and FFT size shall be represented by a unique subprofile. Clause 12 shall not delete the WirelessMAN-OFDMA/2005 profile, nor edit it other than to make minor maintenance changes that are deemed essential. Furthermore, the P802.16m draft will not substantively alter any normative content references by the WirelessMAN-OFDMA/2005 profile, other than to make minor maintenance changes that are deemed essential. If any maintenance changes are made, the P802.16m draft shall rename the WirelessMAN-OFDMA/2005 profile as "WirelessMAN-OFDMA/2005r1". The nature of any such maintenance changes shall ensure that devices compliant to the originally specified WirelessMAN-OFDMA/2005 profile shall be compliant with WirelessMAN-OFDMA/2005r1.

Each subprofile in the WirelessMAN-OFDMA/2008 profile shall require legacy support for the corresponding subprofile (i.e., the subprofile with matching duplexing and FFT size) in WirelessMAN-OFDMA/2008, specified as follows:

- A WirelessMAN-OFDMA/2008 MS [should] [shall] interoperate with a WirelessMAN-OFDMA/2005 BS at a level of performance that is equivalent to that of a WirelessMAN-OFDMA/2005 MS.
- A WirelessMAN-OFDMA/2008 BS shall interoperate with a WirelessMAN-OFDMA/2005 MSs at a level of performance that is equivalent to that of a WirelessMAN-OFDMA/2005 BS.
- A WirelessMAN-OFDMA/2008 BS shall support concurrent operation of both WirelessMAN-OFDMA/2005 and WirelessMAN-OFDMA/2008 MSs on the same RF carrier.

- A WirelessMAN-OFDMA/2008 BS shall support seamless handover of WirelessMAN-OFDMA/2005 MSs to and from WirelessMAN-OFDMA/2005 BSs.
- [additional conditions to be determined]

Globally, replace references to 802.16e (“legacy”, “reference system”, etc.) with appropriate usage of “WirelessMAN-OFDMA/2005”.

Globally, replace references to 802.16m systems and devices with appropriate usage of “WirelessMAN-OFDMA/2008”.