

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >
Title	IEEE 802.16m System Requirements
Date Submitted	2007-10-19
Source(s)	802.16m Requirements Editor: mark.cudak@motorola.com Mark Cudak Motorola
Re:	Requirements for P802.16m-Advanced Air Interface
Abstract	This is the approved baseline TGM System Requirements. As directed by TGM, the document has been revised according to the comment resolution conducted by TGM in Session #51
Purpose	Updated high-level system requirements for the P802.16m draft
Notice	<i>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.</i>
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 >.

Contents

1	<u>Contents</u>		
2			
3	1.0	Overview.....	4
4	2.0	References.....	5
5	3.0	Definitions.....	6
6	4.0	Abbreviations and acronyms.....	7
7	5.0	General requirements.....	8
8	5.1	Legacy support.....	8
9	5.2	Complexity.....	8
10	5.3	Services.....	9
11	5.4	Operating frequencies.....	9
12	5.5	Operating bandwidths.....	9
13	5.6	Duplex schemes.....	9
14	5.7	Support of advanced antenna techniques.....	10
15	5.8	Support for government mandates and public safety.....	10
16	6.0	Functional requirements.....	11
17	6.1	Peak data rate.....	11
18	6.2	Latency.....	12
19	6.2.1	Data latency.....	12
20	6.2.2	State transition latency.....	12
21	6.2.3	Handover interruption time.....	13
22	6.3	QoS.....	13
23	6.4	Radio resource management.....	13
24	6.4.1	Reporting.....	13
25	6.4.2	Interference management.....	14
26	6.5	Security.....	14
27	6.6	Handover.....	14
28	6.7	Enhanced multicast broadcast service.....	14
29	6.7.1	MBS channel reselection delay and interruption times.....	15
30	6.8	Location based services (LBS).....	15
31	6.9	Reduction of user overhead.....	15
32	6.10	System overhead.....	15
33	6.11	Enhanced power saving.....	15
34	6.12	Multi-RAT operation.....	15
35	7.0	Performance requirements.....	16
36	7.1	User throughput.....	16
37	7.1.1	Relative performance.....	16
38	7.1.2	Absolute performance.....	16
39	7.2	Sector throughput and VoIP capacity.....	17
40	7.2.1	Relative sector throughput and VoIP capacity.....	17
41	7.2.2	Absolute sector throughput and VoIP capacity.....	17
42	7.3	Mobility.....	18
43	7.4	Cell coverage.....	18
44	7.5	Enhanced multicast-broadcast service.....	19
45	7.6	Location-based services performance.....	20

1 8.0 Operational requirements..... 20

2 8.1 Support for multi-hop relay 20

3 8.2 Synchronization 20

4 8.3 Co-deployment with other networks..... 20

5 8.3.1 Co-deployment requirements..... 20

6 8.3.2 Coexistence scenarios 21

7 8.4 Support of self organizing mechanisms 21

8 Annex A: Usage models (informative)..... 22

9 A.1 Service and application scenarios 22

10 A.2 Deployment scenarios..... 23

11 A.2.1 Frequency reuse 23

12 A.2.2 Deployment with multi-hop relay networks 23

13 A.2.3 High mobility optimized scenario..... 26

14 A.2.4 Provision for PAN/LAN/WAN collocation / coexistence..... 26

15 A.2.5 Very high data rates in smaller cells 26

1

2 **1.0 Overview**

3

4 The 802.16m amendment shall be developed in accordance with the P802.16 project authorization
5 request (PAR), as approved on 6 December 2006 [1], and with the Five Criteria Statement in IEEE
6 802.16-06/055r3 [2].

7 According to the PAR, the standard shall be developed as an amendment to IEEE Std 802.16 [3][4]. The
8 resulting standard shall fit within the following scope:

9 *This standard amends the IEEE 802.16 WirelessMAN-OFDMA specification to provide an*
10 *advanced air interface for operation in licensed bands. It meets the cellular layer requirements*
11 *of IMT-Advanced next generation mobile networks. This amendment provides continuing support*
12 *for legacy WirelessMAN-OFDMA equipment.*

13

14 And the standard will address the following purpose:

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

18

19 The standard is intended to be a candidate for consideration in the IMT-Advanced evaluation process
20 being conducted by the International Telecommunications Union– Radio Communications Sector (ITU-
21 R) [5][6][7].

22 This document represents the high-level system requirements for the 802.16m amendment. All content
23 included in any draft of the 802.16m amendment shall meet these requirements. This document,
24 however, shall be maintained and may evolve. These system requirements embodied herein are defined
25 to ensure competitiveness of the evolved air interface with respect to other mobile broadband radio
26 access technologies as well as to ensure support and satisfactory performance for emerging services and
27 applications. These system requirements also call for significant gains and improvements relative to the
28 preexisting IEEE 802.16 system that would justify the creation of the advanced air interface.

29 To accelerate the completion and evaluation of the standard, to improve the clarity and reduce
30 complexity of the standard specification, and to further facilitate the deployment of new systems, the
31 number of optional features should be minimized.

1

2 **2.0 References**

- 3 [1] IEEE 802.16m PAR, December 2006, <http://standards.ieee.org/board/nes/projects/802-16m.pdf>
- 4 [2] IEEE 802.16 WG, "Five Criteria Statement for P802.16m PAR Proposal," IEEE 802.16-06/55r3,
5 November 2006, http://ieee802.org/16/docs/06/80216-06_055r3.pdf
- 6 [3] IEEE Std 802.16-2004: Part 16: IEEE Standard for Local and metropolitan area networks: Air
7 Interface for Fixed Broadband Wireless Access Systems, June 2004
- 8 [4] IEEE Std. 802.16e-2005, IEEE Standard for Local and metropolitan area networks, Part 16: Air
9 Interface for Fixed and Mobile Broadband Wireless Access Systems, Amendment 2: Physical
10 and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed
11 Bands, and IEEE Std. 802.16-2004/Cor1-2005, Corrigendum 1, December 2005
- 12 [5] Recommendation ITU-R M.1645: Framework and overall objectives of the future development
13 of IMT-2000 and systems beyond IMT-2000, January 2003
- 14 [6] ITU-R Document 8F/TEMP/568: Guidelines for evaluation of radio interface technologies for
15 IMT-Advanced, May 2007
- 16 [7] ITU-R Document 8F/TEMP/574: Requirements related to technical system performance for
17 IMT-Advanced radio interface(s) [IMT.TECH] , May 2007
- 18 [8] WiMAX Forum™ Mobile System Profile, Release 1.0 Approved Specification (Revision 1.4.0:
19 2007-05-02), <http://www.wimaxforum.org/technology/documents>
- 20 [9] FCC Docket no 94-102 this includes order numbers 96-264, 99-96, 99-245.
- 21 [10] Communications Assistance for Law Enforcement Act of 1994 (CALEA), Pub. L. No. 103-414,
22 108 Stat. 4279.
- 23 [11] Communications Assistance for Law Enforcement Act and Broadband Access and Services First
24 Report and Order and Further Notice of Proposed Rulemaking. ET Docket No. 04-295, RM-
25 10865, 20 FCC Rcd 14989 (2005).
- 26 [12] IEEE 802.16 TGm, "IEEE 802.16m Evaluation Methodology Document,"
27 IEEE 802.16m-07/037

28

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.