

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Section 8 - Deployment-Related Requirements for IEEE 802.16m	
Date Submitted	2007-02-23	
Source(s)	Jin Sam Kwak Yeong-Hyeon Kwon Wookbong Lee Ronny (Yong-Ho) Kim LG Electronic Inc. LG R&D Complex, 533 Hogye-1dong, Dongan-gu, Anyang, 431-749, Korea	samji@lge.com wishwill@lge.com wbong@lge.com ronnykim@lge.com Voice: +82-31-450-7902 Fax: +82-31-450-7912
Re:	Call for Contributions on Requirements for 802.16m – Advanced Air Interface, 01/18/07	
Abstract	This contribution provides the deployment-related requirements of advance air interface for 802.16m. In order to specify and realize the deployment issues that should be met by 802.16m-Advanced Air Interface as the next generation mobile networks, this contribution propose the specific requirements including legacy support and spectrum requirements	
Purpose	For discussion and approval by TGM	
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Section 8- Deployment-Related Requirements for IEEE 802.16m

*Jin Sam Kwak, Wookbong Lee, Yeong-Hyeon Kwon, and Ronny (Yong-Ho) Kim
LG Electronic Inc.*

1. Abstract

This contribution provides the deployment requirements of advanced air interface for IEEE 802.16m. In order to specify and realize the deployment issues that should be met as the next generation mobile networks, this contribution propose the specific requirements including legacy support and spectrum requirements.

2. Background

According to the project scope in the IEEE 802.16m PAR and the system requirements for IEEE 802.16m [1], an advanced air interface for IEEE 802.16m shall meet the cellular layer requirements of IMT-Advanced next generation mobile networks. As identified in ITU-R M.1645 [2] and recent related document [3],[4], the general features for IMT-Advanced radio interface have been described as follows:

- High degree of commonality of design worldwide
- Compatibility of services within IMT-Advanced and with the fixed networks
- Small and cheap terminal suitable for worldwide use
- Potential to support larger cell
- Supporting high mobility environment
- Worldwide roaming capability and ubiquitous access
- Capability for multimedia applications within a wide range of services and terminals

Furthermore, the key technologies that should be required to develop the systems beyond IMT-2000 have been also discussed in the various areas such as system related technologies, access network and radio interface, utilization of spectrum, mobile terminals, and applications [2]. It is possible that the potential technologies with new radio interfaces facilitate supporting high data rates of approximately 100Mbps for mobile access and 1Gbps for nomadic/local wireless access

Taking into account the trends and directions regarding the system requirements for IMT-Advanced, it is naturally essential to further clarify and specify the goals that should be necessary to deploy the IEEE 802.16m. In this contribution, the deployment-related requirements, which are itemized in section 8 in [1] as one of key issues on the system requirements, are focused and the specific texts will be also provided.

3. Deployment-Related Requirements for IEEE 802.16m

In order to realize the deployment issues that should be met by IEEE 802.16m as the next generation mobile networks, the deployment-related requirements regarding legacy support (clause 8.1) and spectrum requirements (clause 8.2) in [1] are further considered as follows.

8.1 Legacy support

According to the requirements of IMT-Advanced next generation mobile networks [1], [2], the IEEE 802.16m shall support wide coverage range (up to 50 km of a cell radius) and various mobility classes (up to 500 km/hr) with increased user throughput/spectral efficiency. Furthermore, it is also required for the IEEE 802.16m to operate a broadband over 20 MHz as well as provide continuing support of the legacy 802.16 systems. Consequently, the text proposal regarding legacy support, which shall be met by IEEE 802.16m, should encompass those considerations in order to meet the high-level requirements for the IMT-Advanced system and

support legacy systems simultaneously.

8.2 Spectrum requirements

It is expected that new spectrum requirements for IMT-Advanced systems, which frequency bands might be suitable, will be addressed at a WRC 07. To this end, the spectrum usage survey has been recently conducted [5], in which the candidate frequency bands may be considered at 450 MHz, 800 MHz, 3.4 ~ 4.2 GHz, and 4.4 ~ 5.0 GHz. In order to achieve the peak aggregate data rate (i.e., 100 Mbps for mobile users and 1 Gbps for nomadic/local wireless access) and user throughput required for IMT-Advanced system at the candidate frequency bands, it is required that IEEE 802.16m shall support the scalable bandwidth as well as share/reutilize frequency with the legacy systems. Furthermore, wider bandwidth support over 20 MHz should be also considered. The text proposal regarding spectrum requirements, which shall be met by IEEE 802.16m, should encompass those considerations in order to support the high-level functional/performance requirements in section 6 and 7.

4. Proposed Deployment-Related Requirements for IEEE 802.16m

Based on the above considerations of deployment-related requirements for IEEE 802.16m, the specific text proposals regarding legacy support (clause 8.1), spectrum requirement (clause 8.2) in [1] are given as follows.

8.1 Legacy support

IEEE 802.16m system shall meet the IMT-Advanced performance/capability requirements and support legacy terminals simultaneously. In view of continuing support for legacy 802.16 systems, the legacy 802.16 terminals shall be able to be supported within the spectrum band(s) where the IEEE 802.16m might be deployed.

8.2 Spectrum requirements

In order that the IEEE 802.16m effectively supports the functional and performance requirements in section 6 and 7, the spectrum-related requirements below should be taken into consideration.

- The IEEE 802.16m shall support the scalable bandwidth.
- The IEEE 802.16m shall support sufficient bandwidth that might be considered to achieve the high-level functional/performance requirements in section 6 and 7.
- The IEEE 802.16m shall be able to share or reutilize the bandwidth with the legacy systems.
- The IEEE 802.16m shall be able to operate in paired and unpaired spectrum.

References

- [1] IEEE C802.16m-07/002: Draft IEEE 802.16m Requirements, January 2007.
- [2] Recommendation ITU-R M.1645: Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000, January 2003.
- [3] ITU-R Document 8F/TEMP/496-E: Draft [Report on] Requirements Related to Technical System Performance for IMT-Advanced Radio Interface(s), January 2007.
- [4] IEEE C802.16m-07/007: IEEE 802.16m Requirements, LG Electronics, January 2007.
- [5] ITU-R Document 8F/TEMP/363: Summary of Spectrum Usage Survey Results for WRC-07 Agenda Item

1.4, February 2006

[6] IEEE Std 802.16-2004, “IEEE Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed Broadband Wireless Access Systems.”

[7] IEEE Std 802.16e-2005, IEEE Std 802.16-2004/Cor 1-2005, “IEEE Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems, Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands and Corrigendum 1.”

[8] P802.16-2004/Cor2/D2, “Draft Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems Corrigendum 2.”