IEEE 802.16 Working Group on Broadband Wireless Access

http://WirelessMAN.org

Dr. Roger B Marks
NIST
325 Broadway, MC 813.00
Boulder, CO 80305 USA
Tel: +1 303 497 3037
mailto:marks@nist.gov
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To: Mr. Valery Timofeev
Director, International Telecommunication Union, Radiocommunication Bureau
CH-1211 Geneva 20, Switzerland
mailto:valery.timofeev@itu.int

The IEEE 802.16 Working Group (WG) on Broadband Wireless Access* acknowledges receipt of the Document (numbered ITU-R 8A/15, 8A-9B/3, 9B/6 and IEEE L802.16-03/11) of 4 November 2003 containing the notes of the IEEE/ITU Conference Call of 28 October 2003. The WG welcomes this opportunity for a dialog with ITU-R, particularly since IEEE has recently become an ITU-R Sector Member as an international organization.

The IEEE 802.16 WG has developed IEEE Standard 802.16-2001 ("Air Interface for Fixed Broadband Wireless Access Systems") and several amendments (IEEE 802.16a-2003 and IEEE 802.16c-2002). Additionally the WG has prepared related conformance standards and a recommended practice on coexistence (IEEE 802.16.2-2001, with a revision to be approved in the near future). The IEEE 802.16 standard describes a wireless broadband access system for carrier-class last-mile access to public networks, both IP and ATM, with full QoS support. Depending on the frequency band and implementation details, an IEEE 802.16 access system could support a wide range of applications, from commercial services to residential applications in both urban and rural areas. The WG is actively continuing to refine, expand, and enhance the standards, with current efforts focused in three areas: (1) revising and updating the standard for fixed access; (2) enhancing the standard to add support for mobile terminals in the P802.16e project; (3) specifying additional conformance standards.

The IEEE 802.16 WG is truly international in character and scope. For example, at our 10-13 November Session #28 we had participants from all three ITU regions and agreed to hold our May 2004 Session #31 in China. IEEE 802.16 also maintains cooperative relationships with regional standards organizations such as ETSI.

At the November meeting the WG discussed liaison activities with ITU. In that regard we reappointed Mr. José Costa as our liaison to ITU-R. Within IEEE 802, regulatory issues are handled by a specialized group, the IEEE 802.18 Radio Regulatory Technical Advisory Group. We have not appointed a liaison to ITU-T SG 15.

The WG discussed the proposed action item from the conference call that "IEEE 802.16 will propose what the expected ITU-R Recommendation should cover." The 802.16 WG agreed that developing an ITU-R Recommendation is a worthwhile goal. It was felt that goal could best be achieved by providing a summary of

* The views expressed in this communication are those of the IEEE 802.16 Working Group and do not necessarily represent the views of the IEEE 802 LAN/MAN Standards Committee, the IEEE Standards Association, or the IEEE.

IEEE Standard 802.16 with a reference to the full standard. The WG appreciated that the use of an external reference may be considered an inconvenience by some. However, using the reference method would serve to significantly reduce the maintenance burden for both organizations and ensure that the latest changes are available to the ITU-R membership. Additionally it would greatly reduce the cost to the ITU-R of producing the standard. The current in-process revision of this standard is nearly 800 pages. IEEE 802 policy is that standards are free beginning six months after their release, and all three of the IEEE 802.16 air interface standards are currently downloadable from *Get IEEE 802™* web site <http://standards.ieee.org/getieee802>. A summary of the current IEEE Standard 802.16 is provided in the Appendix below.

The WG understands that developing such a Recommendation may cause consequential changes to other ITU-R Recommendations and handbooks. It was felt that the WG is not competent to determine what those consequential changes could be. The WG would be pleased to help in developing those changes once the relevant Recommendations and handbooks are identified.

The WG also agreed that the IEEE Standard 802.16 is directly relevant to ITU-D Question 20/2. This standard was cited numerous times in the October 2003 ITU Internet Report "The Birth of Broadband". We believe that the summary in the Appendix below would be suitable material for insertion into ITU-D Document 2/121, "Draft Report on Question 20/2: Broadband Access Technologies." IEEE 802.16 looks forward to active participation in development of the response to ITU-D on Q.20/2 for the preparation of a roadmap for the choices of wireless broadband access solutions for rural and underserved areas.

The IEEE 802.16 Working Group appreciates ITU-R's interest in our work and activities. We are happy to assist you or work with you on technical issues and look forward to a productive relationship.

Sincerely,

Dr. Roger B. Marks
Chair, IEEE 802.16 Working Group on Broadband Wireless Access

cc: Paul Nikolich, Chair, IEEE 802 LAN/MAN Standards Committee
Kevin Hughes, ITU-BR SG Dept. Head
Fabio Leite, ITU-BR SG Dept. Counsellor
José Costa, IEEE 802.16 Liaison Officer to ITU-R
IEEE 802.18, ITU-T SG 15, ITU-D Q.20/2

Appendix

Broadband Wireless Access Systems

A unique class of wireless systems supporting broadband access has been defined and internationally standardized by the IEEE 802.16 Working Group on Broadband Wireless Access. The group's approved and published standards include IEEE Standard 802.16-2001 ("Air Interface for Fixed Broadband Wireless Access Systems") and several amendments (IEEE 802.16a-2003 and IEEE 802.16c-2002) as well as related conformance standards and a recommended practice on coexistence (IEEE 802.16.2-2001, with a revision expected to be approved soon).

The IEEE 802.16 technology is known as "WirelessMAN" for Wireless Metropolitan Area Networks. The word "metropolitan" refers not to the application but to the scale. The design is primarily oriented toward outdoor applications. The architecture is point-to-multipoint, with a base station serving subscribers in a cell than can range up to about 50 km. As of late 2003, the standard supports terminals that are fixed or nomadic, so it is ideal for providing access to buildings, such as businesses, homes, Internet cafes, telephone shops (telecenters), etc. Product implementations are in development.

As of late 2003, an amendment project (P802.16e) is developing enhancements to support mobile as well as fixed terminals; completion is expected in the autumn of 2004. At the current time, the standard is not optimized to provide service directly to a human user. Instead, the purpose is to provide broadband access to a site, such as a building. Distribution of the content throughout the site would normally be by conventional means, such as IEEE 802.11 WLAN hot spot, IEEE 802.3 Ethernet networks, T1/E1, etc., depending on the required service.

The key feature of the IEEE 802.16 air interface is the medium-access control layer (MAC), which specifies a mechanism for controlling access to the airwaves. The IEEE 802.16 MAC is based on demand-assigned multiple access in which transmissions are scheduled according to priority and availability. This design is driven by the need to support carrier-class last-mile access to public networks, both IP and ATM, with full QoS support. Depending on the frequency band and implementation details, an IEEE 802.16 access system could support a wide range of applications, from commercial services to residential applications in both urban and rural areas. The system could easily support both generic Internet-type data and real-time data, including two-way applications such as voice, videoconferencing, or interactive games.

The standard includes support for a variety of worldwide frequency allocations in either licensed or license-exempt bands. At higher frequencies (10-66 GHz), supported data rates range over 100 Mbit/s per 25 MHz or 28 MHz channel, with many channels available under some administrations. At the lower frequencies (2-11 GHz), typical data rates range up to 70 Mbit/s per channel.

The IEEE 802.16 standards are developed under the IEEE 802 LAN/MAN Standards Committee, an international open standards developing organization with worldwide scope and participants from many countries. It operates in accordance with the "Code of Good Practice for the Preparation, Adoption and Application of Standards" of the World Trade Organization. In October 2003, IEEE has become an ITU-R Sector Member as an international organization.