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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>** |
| Title | **Draft IEEE 802.16m System Requirements: Sections 1 to 4** |
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| Source(s) | Sassan Ahmadi (sassan.ahmadi@intel.com)<br>Kamran Etemad (kamran.etemad@intel.com)<br>Jose Puthenkulam (jose.p.puthenkulam@intel.com),<br>Hassan Yaghoobi (hassan.yaghoobi@intel.com)<br>Intel Corporation<br><br>Hokyu Choi (choihk@samsung.com)<br>Taeyoung Kim (ty33.kim@samsung.com)<br>Jaeweon Cho (jaeweon.cho@samsung.com)<br>DS Park (dspark@samsung.com)<br>Samsung Electronics |
| Re: | Call for contributions regarding P802.16m project, 1/22/2007 |
| Abstract | This document contains proposed system-level and service requirements for IEEE 802.16m standard. |
| Purpose | For discussion and approval by TGm |
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## Contents

1.0 Overview....3
2.0 References....5
3.0 Definitions....6
4.0 Abbreviations and Acronyms....6

## 1.0 Overview

The IEEE 802.16m amendment provides an advanced air interface which further includes enhancements and extensions to IEEE STD 802.16e-2005 to meet the requirements of next generation mobile networks. This standard is intended to be a candidate for consideration in the IMT-Advanced standard evaluation process being conducted by the International Telecommunications Union – Radio Communications Sector (ITU-R). This amendment is based on the WirelessMAN-OFDMA specification and defines a backward compatible evolution of the standard providing interoperability with legacy subscriber stations and base stations.

The purpose of this standard is to update the WirelessMAN-OFDMA air interface in accordance with the requirements defined for the internationally agreed radio interface standards for next generation mobile networks such as IMT-Advanced

This document captures the high-level requirements for the proposed IEEE 802.16m as envisioned by the working group.

This document captures the system requirements for IEEE 802.16m amendment as envisioned by the working group. The system requirements for the IEEE 802.16m are defined to ensure competitiveness of the evolved air-interface with respect to other mobile broadband radio access technologies, and to ensure support and satisfactory performance for the emerging services and applications. The IEEE 802.16m system requirements also call for significant gains and improvements relative to the IEEE 802.16e reference system to justify the creation of a new standard revision/amendment.

This amendment is further required to maintain backward compatibility with the existing deployment of IEEE 802.16e standard. A reference system is defined that includes all mandatory features and a subset of optional features of IEEE 802.16e standard as specified by the Mobile System Profile [1] and is used as the reference for backward compatibility.

This document further describes possible deployment scenarios for IEEE 802.16m standard. These scenarios include topologies consisting of new and legacy mobile and base stations as well as combinations of fixed and mobile relays.

While IEEE 802.16m amendment is expected to further facilitate the use of mobile multi-hop relays, the baseline architecture of the IEEE 802.16m does not include relays and the system requirements shall be met without inclusion of the relay stations.

Some of the requirements in this document are separated for the mobile and the base station. Such requirements shall be construed as minimum performance requirements for the mobile and base stations. It must be noted that the system requirements described in this document shall be met with a system comprising of all new 802.16m compliant mobile and base stations.

To accelerate the completion and evaluation of the standard, and in order to improve the clarity and reduce complexity of the standard specification, and to further facilitate the deployment of the IEEE 802.16m systems, the number of optional features shall be limited to a minimum.

## 2.0 References

[1] WiMAX Forum™ Mobile System Profile, Release 1.0 Approved Specification (Revision 1.2.2: 2006-11-17) (see http://www.wimaxforum.org/technology/documents ).

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

[3] IEEE Std 802.16e-2005: IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems Amendment for Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands, December 2005.

[4] Recommendation ITU-R M.1645: Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000, January 2003

[5] WINNER - WIRELESS WORLD INITIATIVE NEW RADIO: Intermediate requirements per scenario, D 1.2, February 2005 (https://www.ist-winner.org/).

[6] Multi-hop Relay System Evaluation Methodology (Channel Model and Performance Metric), http://ieee802.org/16/relay/docs/80216j-06_013r2.pdf, November 2006.

## 3.0 Definitions

**Sector** – this term refers to physical partitioning of the base station (BS). When there are N transmitting directional antennas in the BS, each of them is named a sector.

**Cell –** A collection of sectors (typically 3) belonging to the same base station.

## 4.0 Abbreviations and Acronyms

| Abbreviation | Description |
|---|---|
| AAS | Adaptive Antenna System |
| BS | Base Station |
| CALEA | Communications Assistance for Law Enforcement Act of 1994 |
| CDF | Cumulative Distribution Function |
| DL | Downlink |
| FCH | Frame Control Header |
| FDD | Frequency Division Duplexing |
| FER | Frame Error Rate |
| FTP | File Transfer Protocol |
| L2/L3 | Layer 2/Layer 3 |
| LAN | Local Area Network |
| LBS | Location Based Services |
| MAC | Medium Access Control |
| MBS | Multicast and Broadcast Service |
| MG | Major Group |
| MIMO | Multiple-Input Multiple-Output |
| MS | Mobile Station |
| OFDMA | Orthogonal Frequency Division Multiple Access |
| PAN | Personal Area Network |
| PHY | Physical Layer |
| PoC | Push over Cellular |
| PUSC | Partial Use of Sub-Carriers |
| QoS | Quality of Service |
| RRM | Radio Resource Management |
| RS | Relay Station |
| TCP | Transport Control Protocol |
| TDD | Time Division Duplexing |
| UL | Uplink |
| VoIP | Voice over Internet Protocol |
| VPN | Virtual Private Network |
| WAN | Wide Area Network |