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Title	Draft IEEE 802.16m System Requirements: Section 5: General Requirements
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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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5.0 General Requirements

This section contains general requirements for IEEE 802.16m systems.

5.1 Legacy Support

The IEEE 802.16m amendment is based on the WirelessMAN-OFDMA specification.

The amendment provides continuing support for legacy subscriber stations. This continuing support shall be limited only to a “harmonized sub-set” of IEEE 802.16e OFDMA features. This harmonized sub-set is captured by the WiMAX Forum™ definition of OFDMA mobile system profiles [1]. The WiMAX mobile system profile shall serve as the 802.16e reference system. All IEEE 802.16e terminals referred herein in this document shall be compliant with the 802.16e reference system.

An 802.16m BS shall support an 802.16e terminal with no degradation of performance.

A 802.16m terminal shall be able to operate with an 802.16e BS, at a level of performance equivalent to that of a 802.16e terminal,

802.16m and 802.16e systems shall be able to operate on the same RF carrier on a 802.16m BS supporting a mix of 802.16m and 802.16e terminals. The performance of such a 802.16m system should be proportional to the fraction of 802.16m terminals attached to the BS.

5.2 Operating Frequencies

The IEEE 802.16m systems shall operate in RF frequencies less than 6 GHz and be deployable in licensed spectrum allocated to the mobile and fixed broadband services and shall be able to operate in frequencies identified for IMT-Advanced.

5.3 Operating Bandwidths

The IEEE 802.16m shall support scalable bandwidths of 5 to 20 MHz. Support for 802.16e bandwidths of 5, 7, 8.75, 10MHz shall be maintained. Performance for these bandwidths and 20MHz shall be optimized in the 802.16m system. Larger bandwidths such as 40 MHz may also be considered.

For the bandwidths larger than 10MHz, aggregation of multiple contiguous bands may be considered.

5.4 Duplex Schemes

The IEEE 802.16m system shall be designed to support both TDD and FDD operational modes. The FDD mode should support both full duplex and half duplex terminal operation. Specifically, a half-duplex FDD terminal is defined as a terminal that is not required to transmit and receive simultaneously.

The system performance in the desired bandwidths specified in Section 5.3 should be optimized for both TDD and FDD independently while retaining as much commonality as possible.

Asymmetric DL/UL bandwidths should be supported for FDD operations (e.g. 10MHz downlink, 5MHz uplink). At the extreme, the IEEE 802.16m system should be capable of supporting downlink-only configurations on a carrier.

5.5 Baseline Antenna Configuration

The IEEE 802.16m standard shall define minimum antenna requirements for the BS and MS. For the BS, a minimum of two transmit and two receive antennas will be supported. For the MS, a minimum of one transmit and two received antennas will be supported. This minimum is consistent with a 2x2 DL downlink configuration and a 1x2 UL configuration.

Other antenna configurations such as DL: 4x2, 2x4, 4x4 and UL: 1x4, 2x2, 2x4, 4x4 may also be optionally supported.

5.6 Complexity

IEEE 802.16m amendment should enable a variety of hardware platforms with different performance/complexity requirements. The system and terminal complexity shall be minimized to decrease the cost of terminals and the RAN.

Therefore, the following shall be taken into account:

- The performance requirements shall be met with mandatory features only
- Minimum number of optional features may be considered only if they provide significant functional and performance improvements over baseline configuration.
- Support of multiple features, mandatory or optional, which are functionally similar and/or have similar impact on performance, shall be avoided.
- Standard changes should focus on areas where the 802.16e reference system can be enhanced to meet the requirements.
- Reduce the number of necessary test cases, e.g. reduce the number of states of protocols, and minimize the number of procedures, appropriate parameter range and granularity.

All enhancements included as part of the IEEE 802.16m amendment should promote the concept of continued evolution allowing IEEE 802.16 to maintain competitive performance as technology advances beyond 802.16m. For example this concept is applicable to enhancements to the downlink/uplink maps, frame structure and message formats.

5.7 Services

IEEE 802.16m service architecture shall be flexible in order to support required services for next generation mobile networks and also those identified by IMT-Advanced

IMT-Advanced QoS requirements shall be supported including end-to-end latency, throughput, and error performance.

IEEE 802.16m system shall provide powerful and efficient security mechanism to protect the network, system, and user.

The system should support existing services more efficiently as well as facilitate the introduction of new/emerging types of services.