Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>	
Title	**Proposed changes to section 8 of the Draft IEEE 802.16m System Description Document**	
Date Submitted	**2008-05-02**	
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Re:	Comments on the IEEE 802.16m-08/003r1 SDD draft – Section 8	
Abstract	802.16m Air-interface protocol structure is described in terms of 16e MAC architecture. We believe that section 8 should be a complete description of the 16m air interface.	
Purpose	Call for comments for IEEE 802.16m meeting in Macao	
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Proposed changes to Section 8 of the SDD

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1 Introduction

802.16m Air-interface protocol structure is described in terms of 16e MAC architecture. It describes the 16m MAC by only outlining the additional functional blocks 802.16m has. It requires the reader to refer to appendix 1 to get the complete description of 16m.

We believe that section 8 should be a complete description of the 16m air interface. And that the description of the 16m MAC should be complete and independent of the 16e MAC. This follows the same approach as the frame structure and the PHY sections of the SDD.

Proposed change:

- Copy all the relevant MAC functional blocks from Appendix 1 into section 8.1
- Describe the 16m MAC as standalone protocol architecture, while reusing to the extent possible functional blocks from 16e, but without an explicit reference to 16e MAC

Proposed Text Changes

Change text as shown below

8 IEEE 802.16m Air-Interface Protocol Structure

8.1 The IEEE 802.16m Protocol Structure

The 802.16m MAC is divided into three sublayers:

- Convergence sublayer (CS)
- Radio Resource Control and Management (RRCM) sublayer
- Medium Access Control (MAC) sublayer

The IEEE 802.16m RRCM includes several functional blocks that are related with radio resource functions such as ~~follows the MAC architecture of current IEEE 802.16e and includes additional fun~~ctional ~~blocks for 802.16m specific features (see Figure 4). The following additional functional blocks are included~~:

- Radio Resource Management
- Mobility Management
- Network-entry Management
- Location Management
- Idle Mode Management
- Security Management
- System Configuration Management
- MBS
- Connection Management
- Routing
- Self Organization
- Multi-Carrier
- ~~Multi-Radio Coexistence~~
- ~~Data forwarding~~
- ~~Interference Management~~
- ~~Inter-BS coordination~~

Radio Resource Management block adjusts radio network parameters related to the traffic load, and also includes function of load control (load balancing), admission control and interference control.

Mobility Management block handles related to handover procedure. Mobility Management block manages candidate neighbor target BSs based on some criteria, e.g. PHY signaling report, loading, etc. and also decides whether MS performs handover operation.

Network-entry Management block is in charge of initialization procedures. Network-entry Management block may generate management messages which needs during initialization procedures, i.e., ranging (this does not mean physical ranging, but ranging message in order to identification, authentication, and CID allocation), basic

capability, registration, and so on.

Location Management block is in charge of supporting location based service (LBS). Location Management block may generate messages including the LBS information. The Idle Mode Management block manages location update operation during idle mode.

Idle Mode Management block controls idle mode operation, and generates the paging advertisement message based on paging message from paging controller in the core network side.

Security Management block is in charge of key management for secure communication. Using managed key, traffic encryption/decryption and authentication are performed.

System Configuration Management block manages system configuration parameters, and generates broadcast control messages such as downlink/uplink channel descriptor (DCD/UCD).

MBS (Multicast and Broadcasting Service) block controls management messages and data associated with broadcasting and/or multicasting service.

Connection Management block allocates connection identifiers (CIDs) during initialization/handover/ service flow creation procedures. Connection Management block interacts with convergence sublayer to classify MAC Service Data Unit (MSDU) from upper layer, and maps MSDU onto a particular transport connection.

Self Organization block performs functions to support self configuration and self optimization mechanisms. The functions include procedures to request MSs to report measurements for self configuration and self optimization and receive the measurements from the MSs.

Multi-carrier (MC) block enables a common MAC entity to control a PHY spanning over multiple frequency channels. The channels may be of different bandwidths (e.g. 5, 10 and 20 MHz), be non-contiguous or belong to different frequency bands. The channels may be of the same or different duplexing modes, e.g. FDD, TDD, or a mix of bidirectional and broadcast only carriers.

The Medium Access Control (MAC) sublayer includes function blocks which are related to the physical layer and link controls such as:

- PHY Control
- Control Signaling
- Sleep Mode Management
- QoS
- Scheduling and Resource and Multiplexing
- ARQ
- Fragmentation/Packing
- MAC PDU formation
- Multi-Radio Coexistence
- Data forwarding
- Interference Management
- Inter-BS coordination

PHY Control block handles PHY signaling such as ranging, measurement/feedback (CQI), and HARQ ACK/NACK. Based on CQI and HARQ ACK/NACK, PHY Control block estimates channel environment of

MS, and performs link adaptation via adjusting modulation and coding scheme (MCS) or power level.

Control Signaling block generates resource allocation messages such as DL/UL-MAP as well as specific control signaling messages, and also generates other signaling messages not in the form of general MAC messages (e.g., DL frame prefix also known as FCH).

Sleep Mode Management block handles sleep mode operation. Sleep Mode Management block may also generate management messages related to sleep operation, and may communicate with Scheduler block in order to operate properly according to sleep period.

QoS block handles rate control based on QoS parameters input from Connection Management function for each connection, and scheduler shall operate based on the input from QoS block in order to meet QoS requirement.

Scheduling and Resource and Multiplexing block schedules and multiplexes packets based on properties of connections. In order to reflect properties of connections Scheduling and Resource and Multiplexing block receives QoS information from QoS block for each connection.

ARQ block handles MAC ARQ function. For ARQ-enabled connections, ARQ block logically splits MAC SDU to ARQ blocks, and numbers to each logical ARQ block. ARQ block may also generate ARQ management messages such as feedback message (ACK/NACK information).

Fragmentation/Packing block performs fragmenting or packing MSDUs based on scheduling results from Scheduler block.

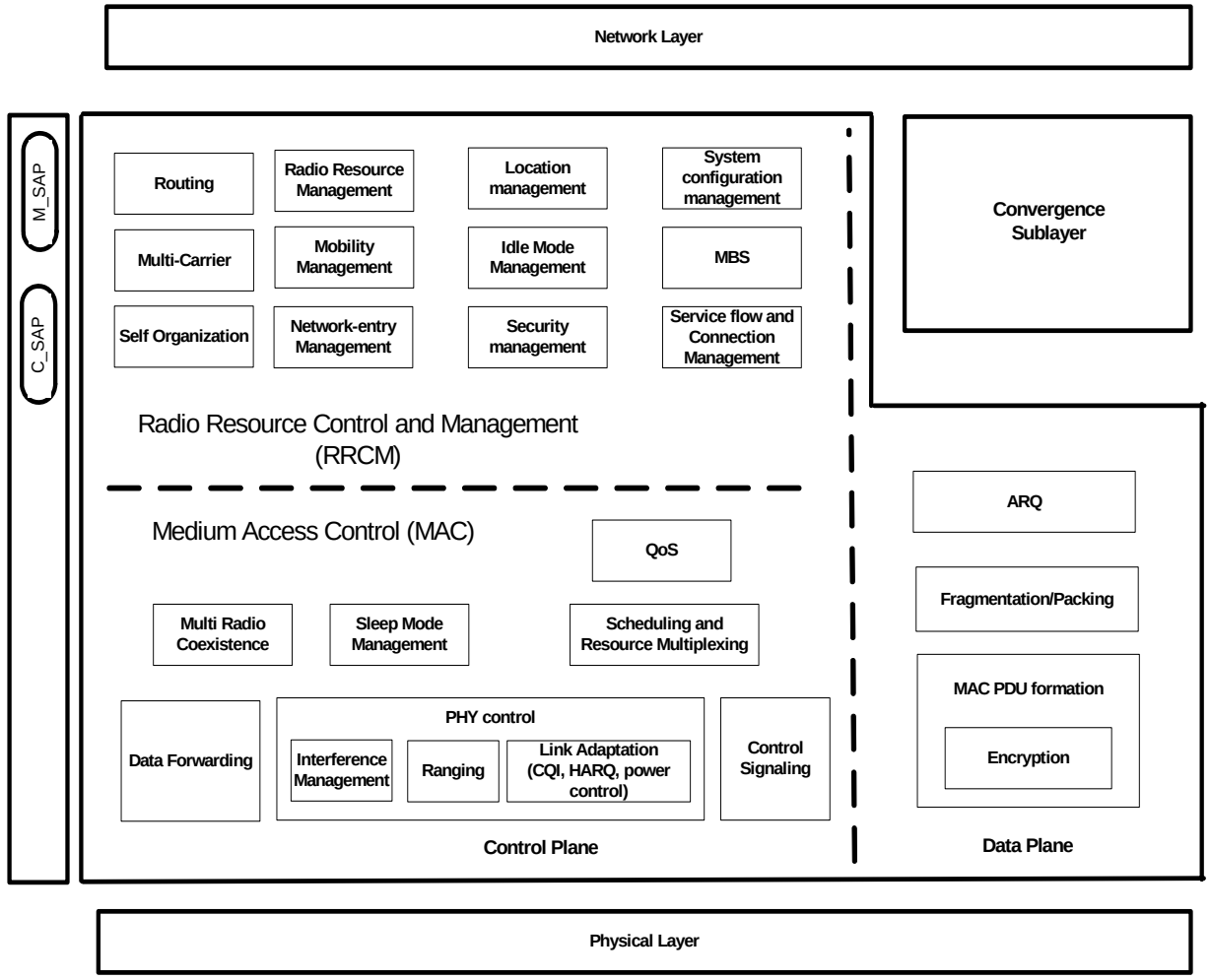
MAC PDU formation block constructs MAC protocol data unit (PDU) so that BS/MS can transmit user traffic or management messages into PHY channel. MAC PDU formation block may add sub-headers or extended sub-headers. MAC PDU formation block may also add MAC CRC if necessary, and add generic MAC header.

Multi-Radio Coexistence block performs functions to support concurrent operations of 802.16m and non-802.16m radios collocated on the same mobile station.

Interference Management block performs functions to manage the inter-cell/sector interference. The operations may include:

- MAC layer operation
  - Interference measurement/assessment report sent via MAC signaling
  - Interference mitigation by scheduling and flexible frequency reuse
- PHY layer operation
  - Transmit power control
  - Interference randomization
  - Interference cancellation
  - Interference measurement
  - Tx beamforming/precoding

Mobility Management block supports functions related to Inter-RAT handover. It handles the Inter-RAT Network topology acquisition which includes the advertisement and measurement, and also decides whether MS performs Inter-RAT handover operation.



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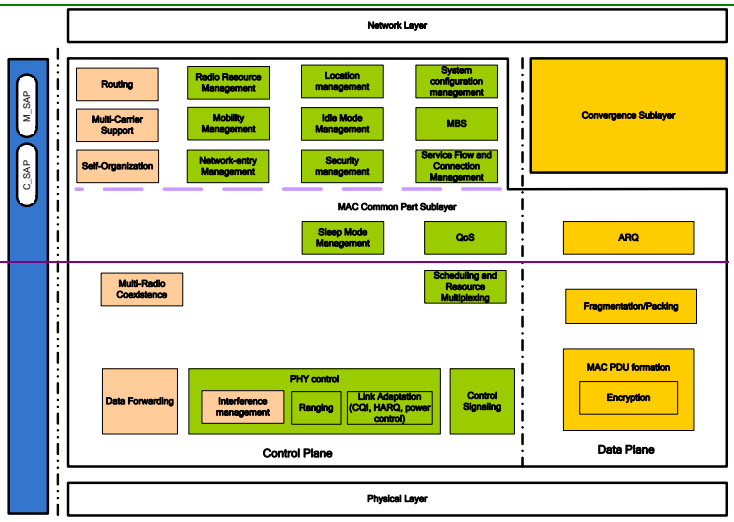

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4 Figure 1 The IEEE 802.16m Protocol Structure