

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Proposed Modification on Protocol Functionalities for Supporting IEEE 802.16m E-MBS	
Date Submitted	2008-1-16	
Source(s)	Chun-Yen Wang, ITRI Richard Li, ITRI Chun-Yuan Chiu, ITRI Chie-Ming Chou, ITRI Fang-Ching (Frank) Ren, ITRI Wern-Ho sheen, NCTU/ITRI	Voice: E-mail: ChunYen@itri.org.tw richard929@itri.org.tw
Re:	IEEE 802.16m-07/047 - Call for Contributions on Project 802.16m System Description Document (SDD), shoot for "Proposed IEEE 802.16m Protocol Architecture and main functionalities per protocol layer" topic.	
Abstract	This contribution proposes some modifications on protocol functionalities from supporting E-MBS point of view.	
Purpose	For discussion and approval by TGm	
Notice	<i>This document does not represent the agreed views of the IEEE 802.16 Working Group or any of its subgroups. It represents only the views of the participants listed in the "Source(s)" field above. It is offered as a basis for discussion. It is not binding on the contributor(s), who reserve(s) the right to add, amend or withdraw material contained herein.</i>	
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.	
Patent Policy	The contributor is familiar with the IEEE-SA Patent Policy and Procedures: < http://standards.ieee.org/guides/bylaws/sect6-7.html#6 > and < http://standards.ieee.org/guides/opman/sect6.html#6.3 >. Further information is located at < http://standards.ieee.org/board/pat/pat-material.html > and < http://standards.ieee.org/board/pat >.	

Proposed Modification on Protocol Functionalities for Supporting IEEE 802.16m E-MBS

Chun-Yen Wang, Richard Li, Chun-Yuan Chiu, Chie-Ming Chou, Fang-Ching (Frank) Ren

ITRI

Wern-Ho sheen

ITRI/NCTU

1. Introduction

In the IEEE 802.16m system requirement document (SRD) [1], it has been agreed that IEEE 802.16m shall support enhanced multicast-broadcast service (E-MBS) in an efficient manner, including achievement of higher spectrum efficiency in multi-cell multicast-broadcast single frequency networks (MBSFN) on both mixed and dedicated frequencies, and minimization of channel-reselection interruption time (especially for the broadcast streaming media services). In addition, IEEE 802.16m shall support switching between E-MBS and unicast services even when they are deployed on different frequencies. Based on the existing 802.16 protocol structure [2], this contribution proposes some modifications on the functionalities of each protocol layer for IEEE 802.16m E-MBS services to meet these requirements.

2. Proposed Modification on Protocol Functionalities

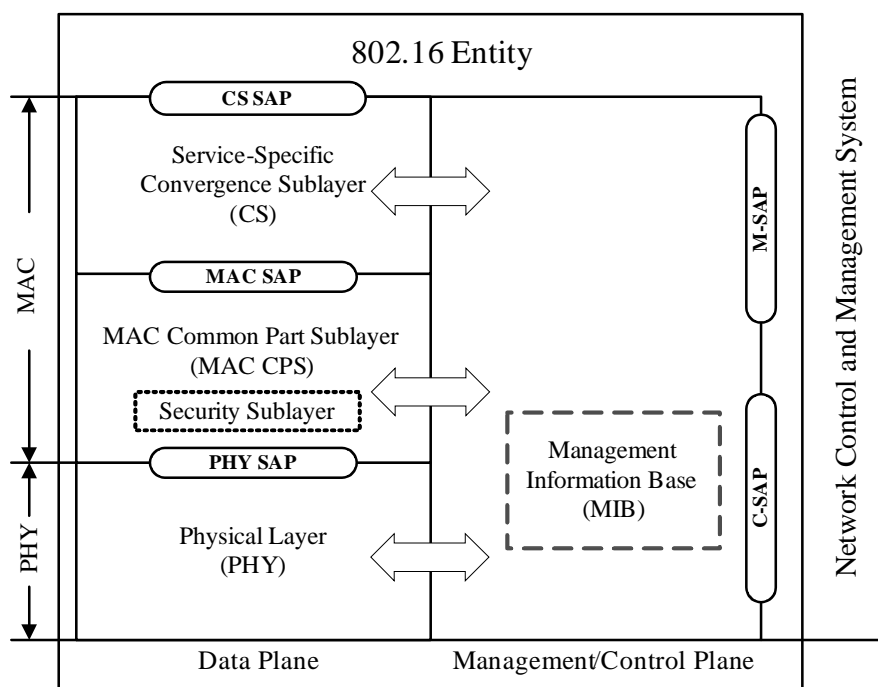


Fig. 1. IEEE 802.16 Protocol Layer

The proposed IEEE 802.16m protocol architecture is similar to that of the existing 802.16 system as shown in Fig. 1 with some modifications as described in the following.

In IEEE 802.16 protocol structure, the Service-Specific Convergence Sublayer is responsible for service

classification and payload header compression (PHS). However, we suggest that PHS (if required) shall be done in the ASN gateway when transmitting E-MBS services. On one hand, we can save many efforts to maintain the header compression context synchronized between multiple BSs to achieve macro diversity transmission; on the other hand, if the PHS is performed in ASN gateway, there is only one compressor context per E-MBS service, so MS's decompressor context can keep the same when moving into a new cell. Therefore, performing PHS in ASN gateway for E-MBS transmission can save handover interruption time and reduce extra implementation complexity.

Proposal 1: The Service-Specific Convergence Sublayer performs payload header compression (PHS) (if required) except for E-MBS transmission.

Most functionality of the MAC Common Part Sublayer (MAC CPS) and Physical layer in single-BS access are kept the same as that for unicast transmission so as to maintain the maximum commonality between E-MBS and unicast transmission. But for MBSFN transmission mode, multiple BSs are mandatory to transmit the same signal at the same time/frequency resource. Therefore, some management operations, such as data scheduling and resource allocation in the MAC CPS layer, and adaptive modulation and coding (AMC) schemes in the PHY layer, shall be controlled by a centralized coordination entity (i.e., MBS server).

Proposal 2: The MAC Common Part Sublayer shall perform data scheduling and resource allocation except for MBSFN transmission.

Proposal 3: The PHY shall adaptively select a suitable radio configuration (e.g., modulation and code rate) except for MBSFN transmission.

3. Conclusions

In this contribution, a modified radio interface protocol functionalities for IEEE 802.16m system is proposed in order to meet the E-MBS requirements, specified in the IEEE 802.16m SRD. It is suggested to capture the proposed modifications into the IEEE 802.16m system description document (SDD).

References

- [1] IEEE 802.16m-07/002r4, "802.16m System Requirements".
- [2] P802.16Rev2/D1, "Part 16: Air Interface for Broadband Wireless Access Systems".
- [3] IEEE C802.16m-07/286r2, "Reference Model and Protocol Architecture for Supporting E-MBS in IEEE 802.16m System".

Proposed Text

The following text is proposed to be captured in the IEEE 802.16m system description document (SDD).

----- *Start of the proposed text* -----

8 IEEE 802.16m Air-Interface Protocol Structure

[Insert the following text into this section]

The service-specific CS performs payload header compression (PHS) (if required) except for E-MBS

transmission.

The MAC CPS shall perform data scheduling and resource allocation except for MBSFN transmission.

The PHY shall adaptively select a suitable radio configuration (e.g., modulation and code rate) except for the MBSFN transmission.

----- End of the text -----