Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**System Description Document (SDD) Proposal**	
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Source(s)	Andreas F. Molisch, Philip V. Orlik, Zhifeng (Jeff) Tao, Jinyun Zhang, *Mitsubishi Electric Research Lab*	Voice: 617-621-{7558,7570, 7557, 7595} Fax: 617-621-7550 {molisch, porlik, tao, jzhang}@merl.com
	Toshiyuki Kuze *Mitsubishi Electric Corp*	Voice: +81-467-41-2885 Fax: +81-467-41-2486 Kuze.Toshiyuki@ah.MitsubishiElectric.co.jp
Re:	Response to the Call for Contributions on Project 802.16m System Description Document (SDD) (i.e., IEEE 802.16m-07/040).	
Abstract	This contribution proposes a table of content and system architecture for 802.16m system description document (SDD).	
Purpose	To adopt the table of content and system architecture proposed herein into IEEE 802.16m system description document (SDD).	
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System Description Document (SDD) Proposal

Andrea F. Molisch, Philip V. Orlik, Zhifeng (Jeff) Tao, Jinyun Zhang
Mitsubishi Electric Research Lab

Toshiyuki Kuze
Mitsubishi Electric Corp

This document provides a table of content and system architecture proposed for IEEE 802.16m system description document (SDD), as a response to the corresponding call for contribution **Error! Reference source not found.**.

1 Overview

1.1 Overall Architecture

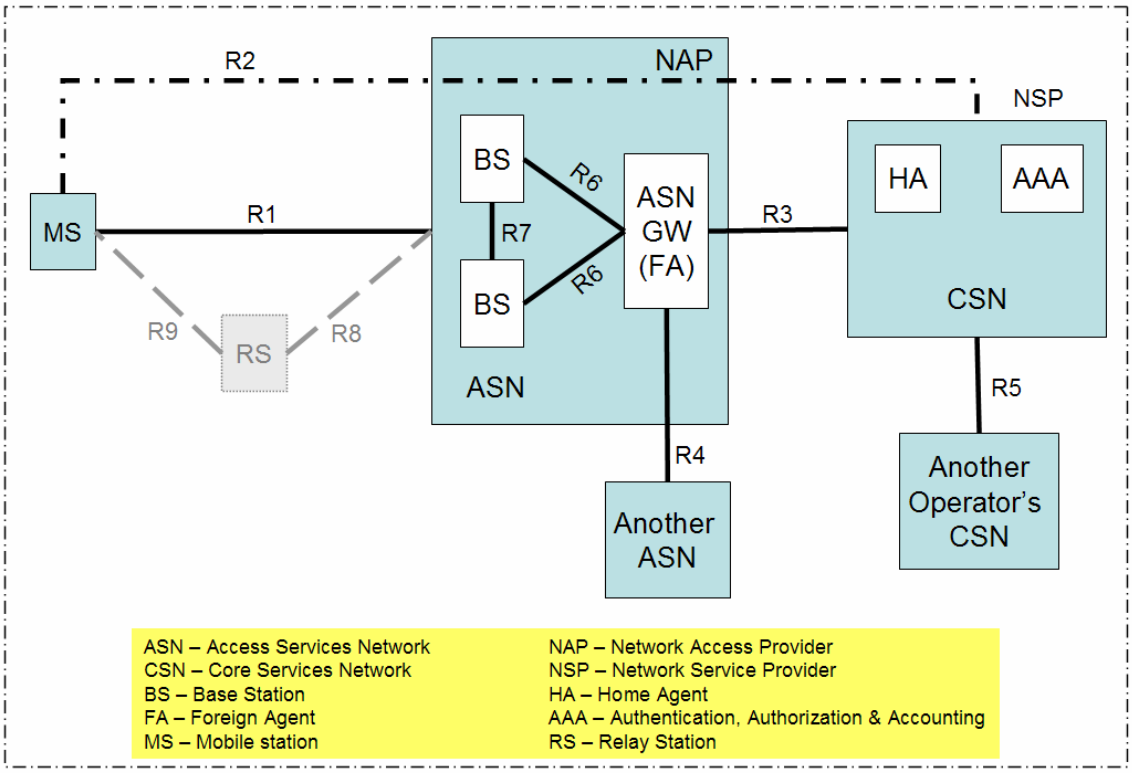

Figure 1: Overall Architecture

The overall system architecture shows two main components the *Core Services Network*, and the *Access Service Network* (ASN). The ASN consists of the Base Stations (BS) and subscriber mobile stations (MS) along with there associated interfaces, R1 defining the radio interface between the MS and BS, R7 defining the interface among BSs. Both interfaces are used to transport user data as well as network control data. To support multihop relay operation, RS and the associated interfaces R8 and R7 may also be introduced. This document specifically addresses the components of this architecture that are related to the IEEE 802.16m amendment. Specifically the ASN and the air interface(s).

1.2 Functional Split

The base stations (BS) host the following functions

- Radio Admission control
- Connection establishment and connection control for mobile devices, i.e., handover processes
- Dynamic resource allocation in both the UL and DL (Scheduling)
- Functions supporting Authentication, key exchange, and encryption

1.3 Interfaces

1.3.1 R1

1.3.2 R7

1.3.3 Radio Protocol Architecture

This section describes the overall radio protocol. IEEE 802.16m defines the physical, PHY, and Medium Access Control, MAC layers as shown in Figure 2

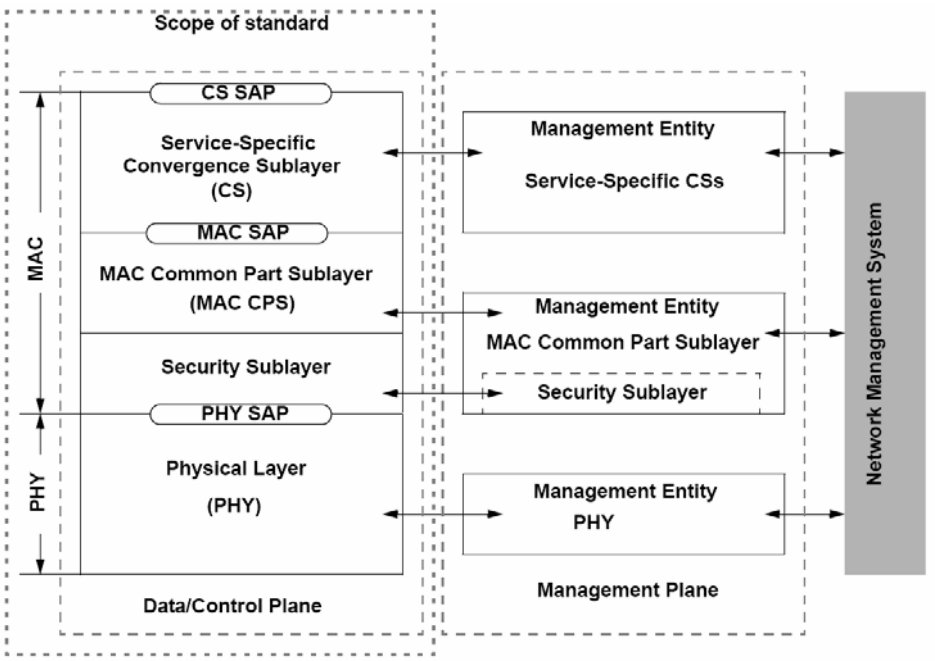

Figure 2 IEEE 802.16m protocol layering

1.4 Frequency bands

- *Insert description of 802.16m frequency bands and typical channel bandwidths (5-20 MHz)*

1.5 Duplex Modes

1.6 Management objects

2 Physical Layer

The functions supported by the physical layer include

- High rate user data transfer over the air interface including OFDMA framing and multiplexing user and control traffic
- Channel measurement and feedback techniques to support higher layer management of the radio resources, handover, advanced antenna system and interference management.
- Features to support enhanced power savings
- Features to support multihop relay

3 Physical layer function (PHY)

3.1 WirelessMAN-OFDMA PHY

3.1.1 Operating Frequency Bands

3.1.2 OFDMA basic terms definition

3.1.3 Introduction and basic frame format

3.1.4 OFDMA symbol description, symbol parameters and transmitted signal

- Insert text to provide update for 802.16m support
- OFDMA numerology for new bandwidths
- Modulation overview
- Adaptive modulation control

3.1.5 Multiple Access Scheme

3.1.5.1 Frame structure

3.1.5.1.1 Duplexing modes

3.1.5.1.2 DL Frame prefix

3.1.5.1.3 Allocation of Subchannels, logical subchannel numbering

3.1.5.1.4 UL Transmission allocations

3.1.5.2 Subcarrier spreading

3.1.5.3 Ranging

3.1.5.3.1 Initial Ranging

3.1.5.3.2 Periodic Ranging

3.1.6 Channel Estimation

3.1.6.1 Pilot Symbol placement

3.1.6.2 Fat Pilots

3.1.6.3 Channel sounding

3.1.6.4 Calibration

3.1.6.5 Feedback

3.1.6.6 Multi-Channel estimation for interference management techniques

3.1.7 Channel coding

3.1.7.1 Convolutional codes

3.1.7.2 Block Turbo Codes

3.1.7.3 Convolutional turbo codes

3.1.7.4 LDPC

3.1.7.5 HARQ

3.1.8 AAS Techniques

3.1.8.1 Space-time coding

3.1.8.2 Spatial Multiplexing

3.1.8.3 Beam Forming

3.1.8.4 Antenna Selection at the BS

3.1.8.5 Antenna Selection at the MS

3.1.8.6 SDMA

3.1.9 Interference management techniques

3.1.9.1 Power control

3.1.9.2 Base Station Cooperation

3.1.9.2.1

3.1.10 Relay support

4 Medium Access Control Layer

Functions supported by the MAC layer include:

- Network entry, initialization, ranging
- Mobility support
- Functions to support new OFDMA-PHY features (e.g., advanced antenna system and interference management)
- Functions to provide reliable communications (e.g., HARQ, ARQ)
- Features to improve the efficiency of the MAC for current OFDMA-PHY
- Features for legacy support
- Features to support multihop relay
- Features for MBS
- Features for power saving
- Multiplexing and scheduling of multiple QoS classes of traffic; mapping of application QoS requirements to radio access network resources

5 MAC layer Components

5.1 Data/Control Plane

5.1.1 Addressing and connections

5.1.2 MPDU formats

5.1.2.1 MAC header formats

5.1.2.2 MAC subheaders and special payloads

5.1.2.3 MAC management messages

5.1.3 Construction and transmission of MPDUs

5.1.4 ARQ mechanism

5.1.5 Scheduling services

5.1.6 Bandwidth allocation and request mechanisms

5.1.7 MAC support of PHY

5.1.8 Contention resolution

5.1.9 Network entry and initialization

5.1.10 Ranging

5.1.11 Update of channel descriptors

5.1.12 Quality of service (QoS)

6 Security sublayer

Security layer shall address the implication of introducing new features and changes into the OFDMA-PHY and MAC layer. In addition, security layer shall also address the potential issue in multihop relay communications.