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Re:	IEEE 802.16m-07/040 – Call for Contribution on IEEE 802.16m System Description Document	
Abstract	The contribution proposes reference model and protocol architecture in SDD document.	
Purpose	Accept the proposal for the baseline SDD document	
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Reference Model and Protocol Architecture for SDD

Haihong Zheng, Shashikant Maheshwari, Yousuf Saifullah and Adrian Boariu

NSN

1 Introduction

This contribution proposes the network reference model and protocol architecture for the 802.16 system. The text to be inserted into SDD document is defined in the following section.

2 Specific Text Change

[Insert following text into subclause 1.4 and 1.5]

1.4 Network Reference Model

This section describes the reference model for 802.16m network and WiMAX radio access network.

1.4.1 Radio Access Network Reference Model

Figure 1 shows a reference model for the radio access network for 802.16m system. It consists of Mobile Stations (MS), Relay Stations (RS), Base Stations (BS), Access Service Network Gateways (ASN GW) and Connectivity Service Network (CSN). The reference model supports both legacy and regular stations. SS/RS/BS refers to 802.16m stations that comply with 802.16m specification. Legacy SS/BS refers to stations that comply with 802.16e specification.

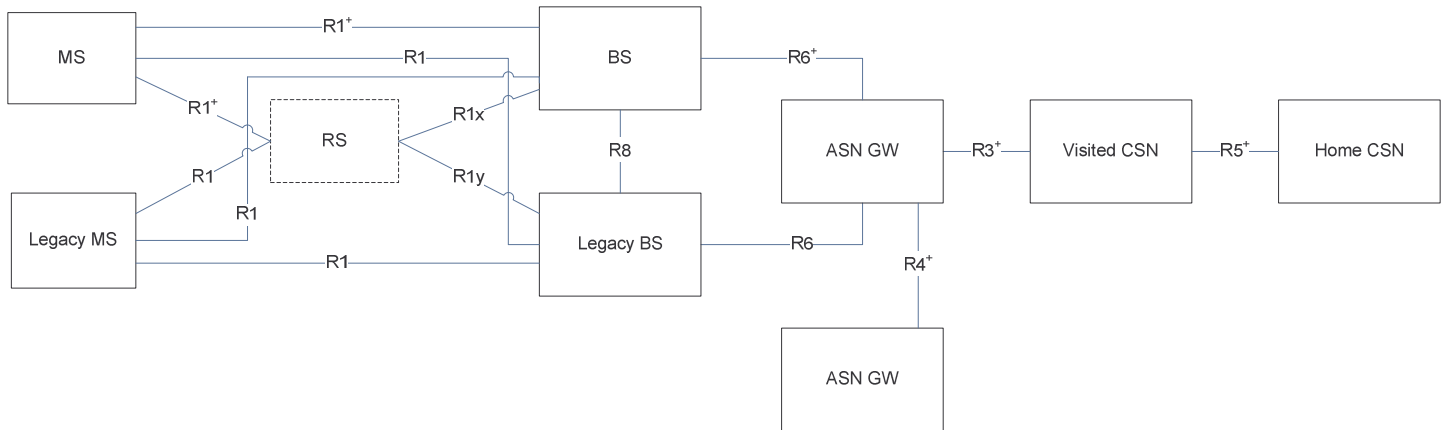


Figure 1: Radio Access Network Reference Model

Interface R_i ($i=1..8$) is defined in [1]. The MS communicates with the BS via the $R1^+$ interface, and the legacy MS communicates with the BS or legacy BS via $R1$ interface, which is a subset of interface $R1^+$. $R1x$ and $R1y$ interfaces are to be defined. The interfaces between the network nodes (i.e., $R6^+$, $R5^+$, $R4^+$, $R3^+$) are based on $R6$, $R5$, $R4$ and $R3$ interfaces with certain enhancement. If no enhancement to $R3$ and $R5$ interfaces is required, they remain the same as in the legacy system.

1.4.2 802.16m Network Reference Model

A simplified reference model for 802.16 network is shown in Figure 2. An 802.16m entity is the logical entity in a SS, RS or BS that comprises the PHY and MAC layers of the data/control plane. The Network Control and Management System (NCMS) provides various control and management functions (as described in section 1.4.3) and resides in both MS and BS. A set of SAPs provide interfaces between NCMS and 802.16m entities.

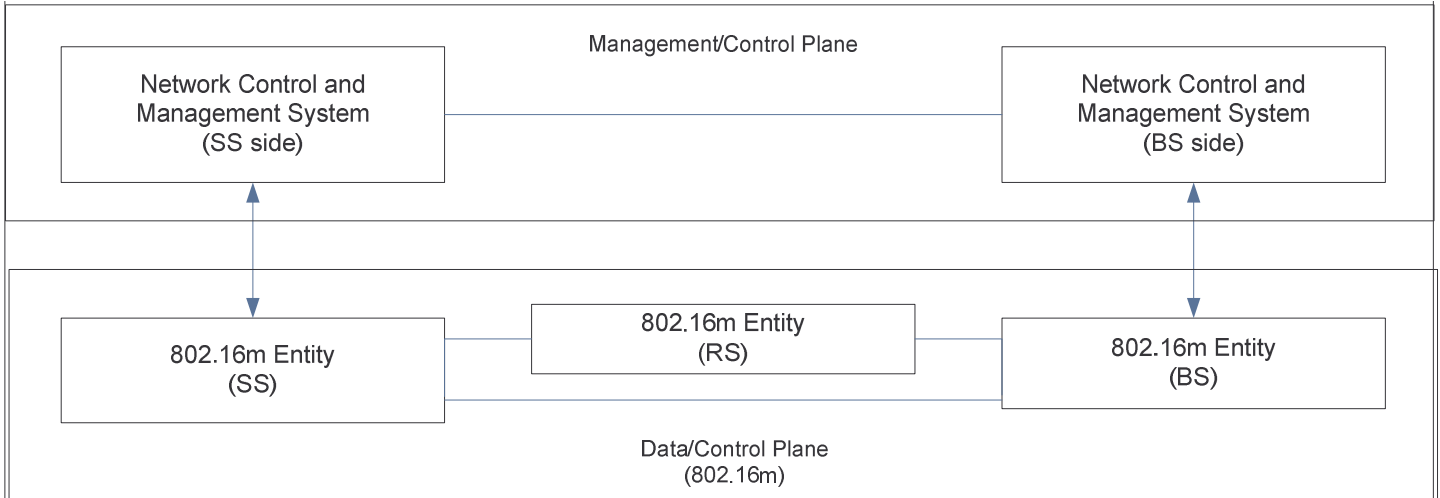


Figure 2: 802.16m Network Reference Model

1.4.3 Network Control and Management System (NCMS)

Network Control and Management System (NCMS) consists of various functional entities as shown in Figure 3. These entities may be centrally located or distributed across the network.

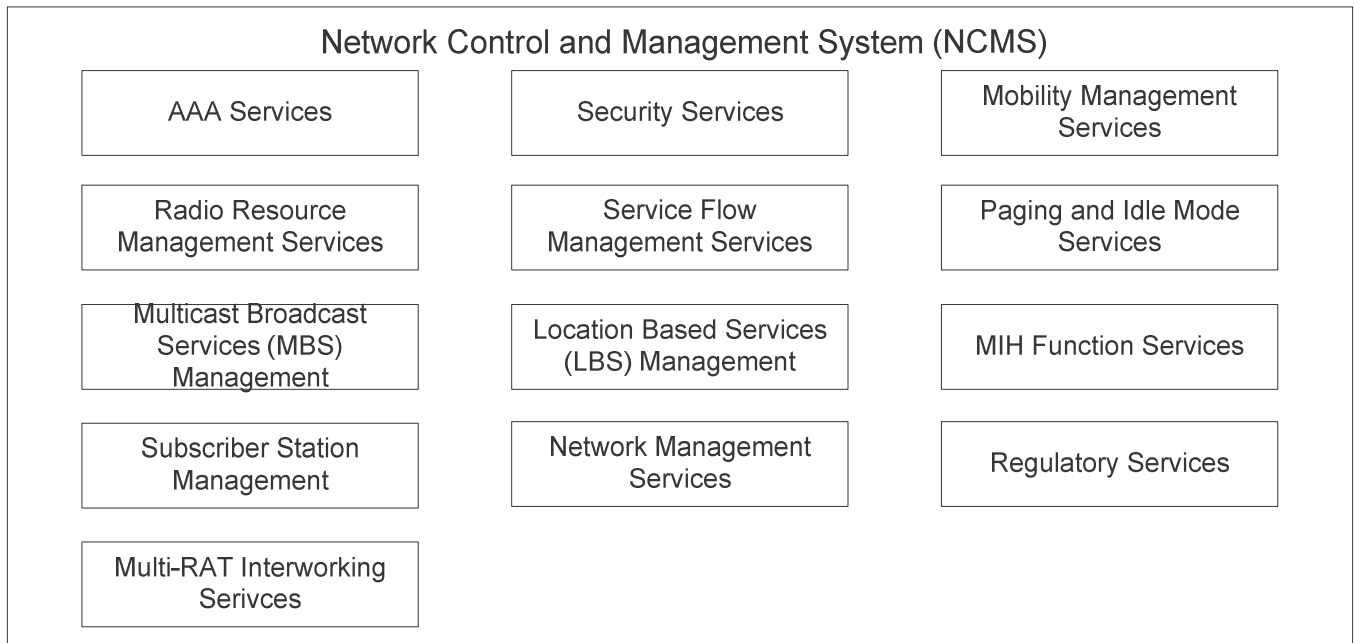


Figure 3: Network Control and Management System

1.5 Protocol Architecture model

Protocol architecture of 802.16 networks is described in this section. Figure 4 and Figure 5 shows the user plane protocol stack on the SS and BS with and without Relay station in between. Figure 6 shows the control plane protocol stack on the SS and BS. MAC layer is comprised of MAC-CS (convergence sub layer) and MAC-CPS (Common Part sub layer).

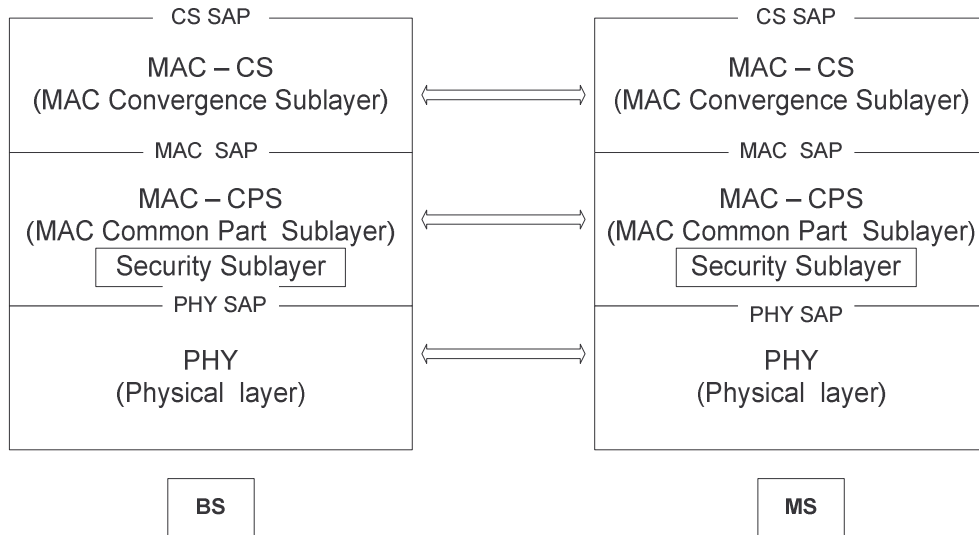


Figure 4: Data Plane Protocol Stack

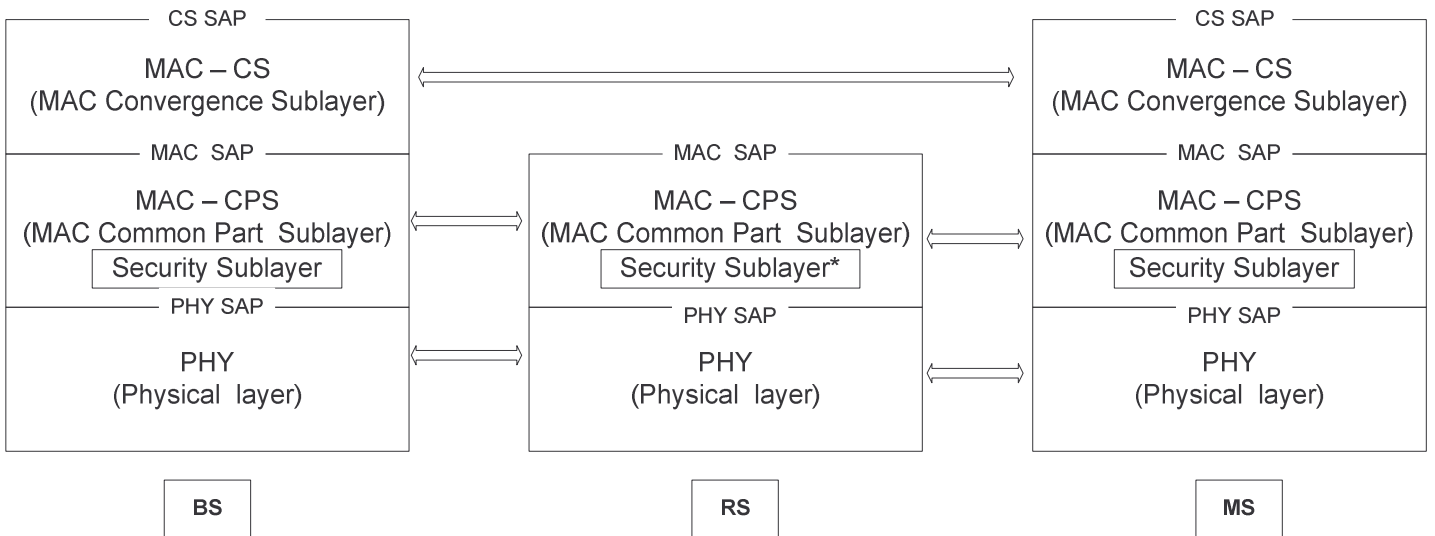


Figure 5: Data Plane protocol Stack (with Relay Station)

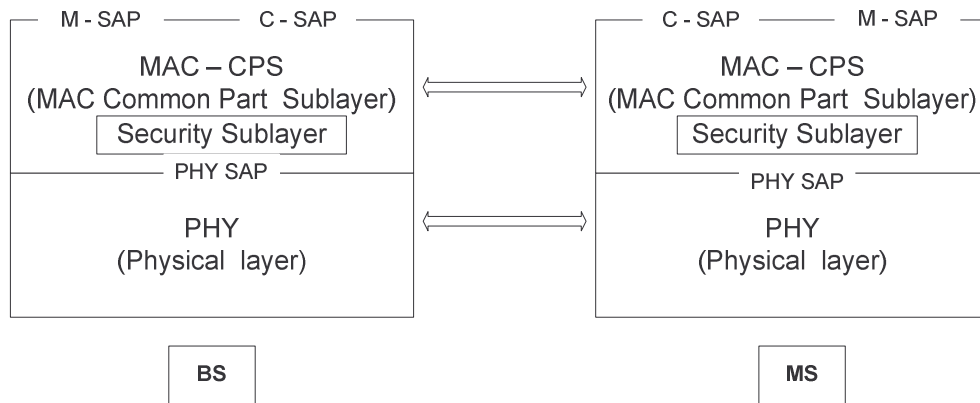


Figure 6: Control Plane Protocol Stack

MAC – CS only exists in the user plane. It implements the functions like Header compression/Header suppression and mapping of upper layer e.g. IP packets to MAC SDU and deliver MAC SDUs to MAC CPS through MAC SAP.

MAC-CPS implements functions like ARQ, HARQ, concatenation, packing, fragmentation, scheduling and security. It also provides the functions such as system access, bandwidth allocation, radio resource management, idle mode management, sleep mode management, connection establishment, and connection maintenance, etc.

Functional decomposition of MAC protocol layer (MAC-CS and MAC-CPS) is described in Figure 7.

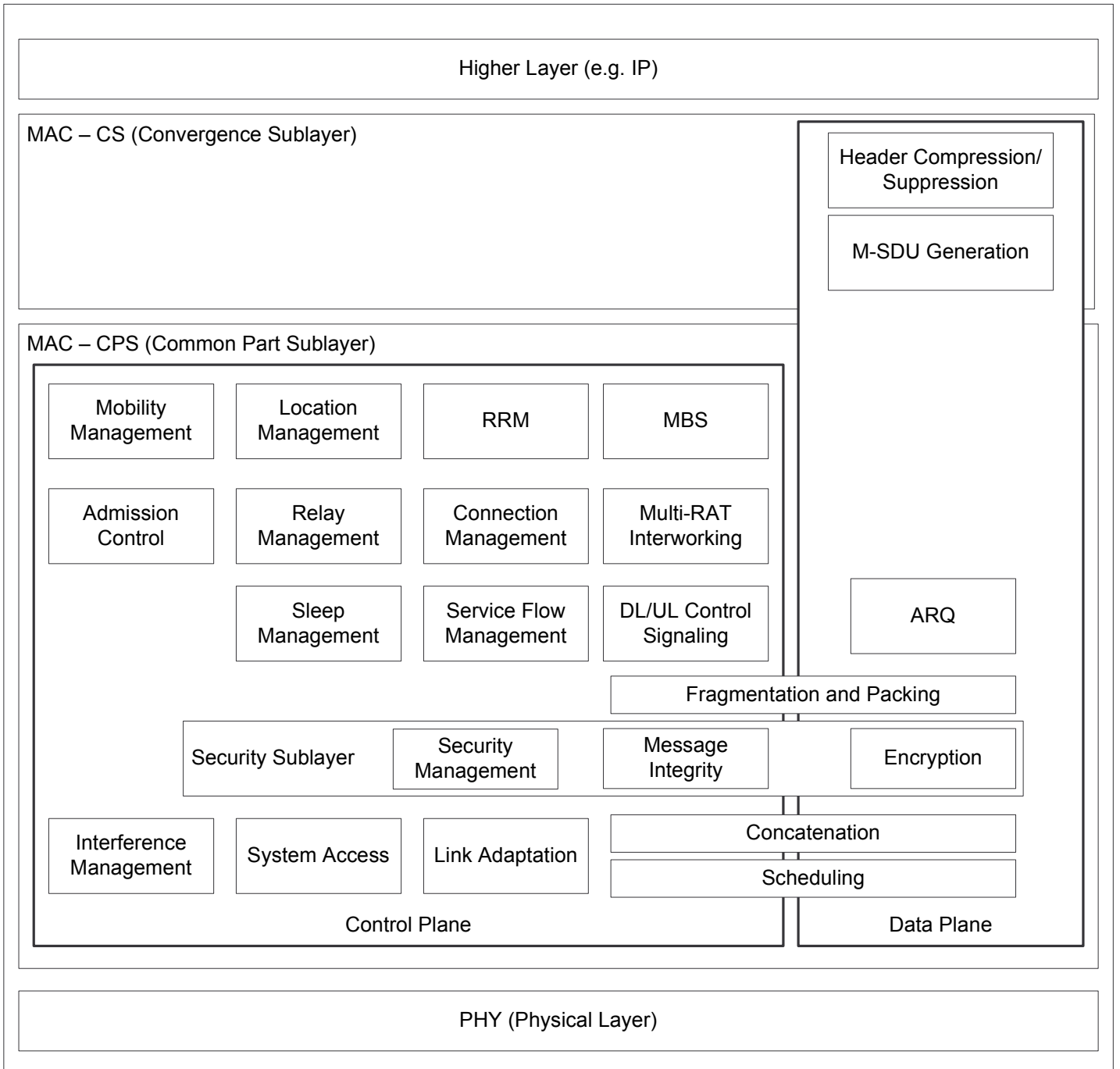


Figure 7: Functional decomposition of MAC Layer Protocol

Reference

[1] WiMAX End-to-End Network Systems Architecture (Stage 2: Architecture Tenets, Reference Model and Reference Points) Release 1.0.0, WiMAX Forum