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Source(s)		
	Jose Puthenkulam, Sanjay Bakshi, Bala Rajagopalan, Prakash Iyer Intel Corporation	Voice: (503) 264 6121 Email: jose.p.puthenkulam@intel.com
	Torsten Fahldieck Alcatel	Voice: +49.711.821 -32163 Email: torsten.fahldieck@alcatel.de
	Nat Natarajan Motorola Inc.	Voice: (847)-632-6303 Email: Nat.Natarajan@motorola.com

Re:	Call for comments
Abstract	
Purpose	This document proposes a 802.16g protocol architecture model
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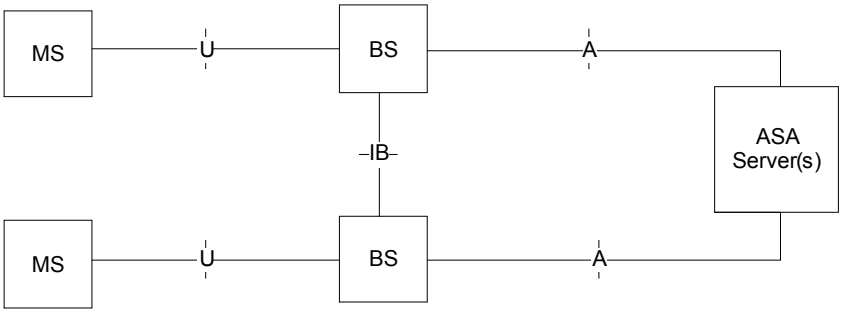
802.16g Protocol Architectural Model

1 Introduction

This contribution currently highlights the various network reference/architecture models defined within P802.16e, P802.16g and tries to briefly analyze the different models. It also proposes a protocol architecture model for P802.16g

2 802.16e Network Reference Model



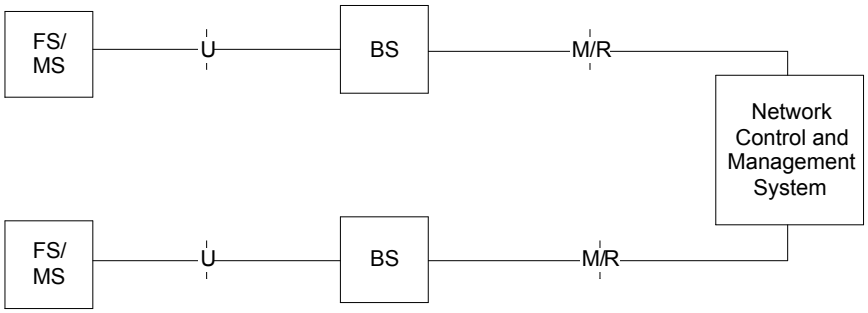
Current 802.16e Network Reference Model

Some observations:

- This model probably over simplifies the network mobility problem by only depicting the Authentication and Service Authorization Servers interfacing to the BSes over the backbone network.
- Layer 3+ protocol entities that possible assist mobility over the air interface are not depicted.
- AAA functions are expected to be implemented over the A interface by ASA servers, the details of which are not specified.
- This model proposes an IB interface between BS for the purposes of HO. The details of IB interface are not specified. However implicit reference to the IB interface between the Serving BS and the Target BS is assumed when HO flow messages are described (Annex C of [1]).
- It does not describe any specific interface at the MAC layer for upper layer control plane or management plane protocols to utilize.

Note: The base 802.16-2004 standard [2] does call out CS SAP and MAC SAP in between protocol layers in section 1.4 and briefly defines the MAC service and SAP in Annex C.

3 Current 802.16g Network Reference Model



Current 802.16g Network Reference Model

Some observations:

- This model also simplifies the network reference model by depicting a Network Control and Management System (NCMS) abstraction behind the BS.

- The U interface is defined for management and control over the air interface.

- The M/R interface addresses Management (M) and Radio Control (R) aspects of the BS and FS/MS by the NCMS. However the NCMS is an abstraction with the intent to abstract the network and all L3+ upper layer interfaces in a network topology agnostic manner.

- As L3+ protocol definitions are outside scope of P802.16g, the specific entities the BS communicates with at L3 are not visible at MAC layer, but they are assumed to be within the NCMS abstraction. L3+ protocols still rely on the MAC Layer (L2) primitives for their proper function. M/R interfaces

- However as all BS will implement L3+ protocols and the M/R interface could essentially be subsumed into the BS protocol stack, and then the figure could be misinterpreted for M/R implying yet another protocol link layer, while it really is a inter-layer protocol interface. So some clarification is needed to make this distinct.

- The current baseline P802.16g document [3] also assumes that the Network services could be centrally located or distributed in the NCMS.

4 802.16g Protocol Architecture Model Proposal

The figure below proposes Control and Management SAPs for interfacing 802.16g to the control and management planes of the NCMS abstraction.

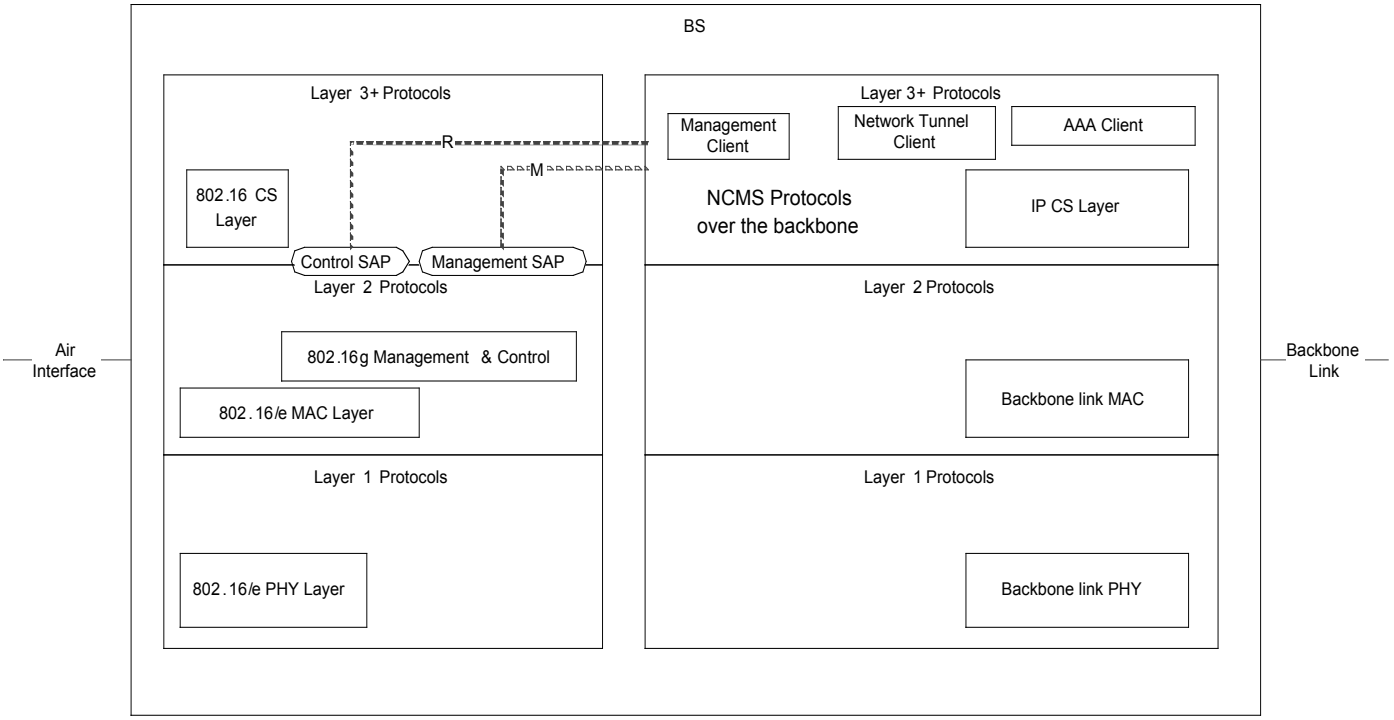


Figure x - 802.16 g SAP interfaces within the BS

The control and management SAP are used for mapping to NCMS protocols over the backbone link. These SAPs provide the minimal primitives by which the L3+ protocols used within the NCMS will be able to invoke any 802.16 MAC control or management plane protocol exchanges over the air interface. 802.16g should also define MAC Layer (L2) context info for use by L3+ protocol specifications in a network agnostic manner.

This should also clarify the P802.16g will not define network protocol messages between BSes and also between BSes and NCMS internal entities as they would be out of scope. Also 802.16g will not define any SAPs for the data/bearer plane protocol aspects.

4.1 Control SAP

This SAP will define primitives for all the relevant MAC management messages that are control plane related. This includes Security, Handoff triggers etc. to/from the upper layers.

4.2 Management SAP

This will define primitives for all the MAC management messages that are management plane related. These include Channel measurements, Setting and Getting Parameters for configuration and also statistics.

5 Proposed Text Changes

[Insert the following text into sections identified]

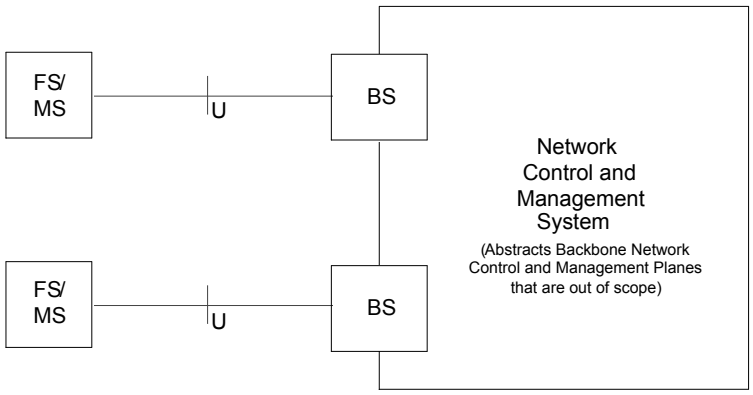
14.4 Architectural Aspects

This specification is intended to enhance the air interface management and control functions and therefore upper layer (Layer 3 and higher) protocols need to an interface to use these MAC layer protocol definitions. So the protocol architecture defines primitives that

are exposed to upper layers in a consistent manner for use by control and management plane protocols in a network agnostic topology agnostic manner.

[Insert the following figure into section identified]

14.4.1 Network Reference Model



802.16g Network Reference Model

[Insert the following text into section identified]

14.4.1.1.2 BS and NCMS Interface

This interface is a functional one and exists above the MAC layer and typically exists within a BS as shown in Figure x below. It is decomposed in to two parts: the M interface used for Management primitives alone and the R (Radio Control) interface used for Control plane primitives that to support handovers, security context management, radio resource management, and low power operations (such as Idle mode and paging functions). The primary goal of such an interface is to ensure protocol separation.

14.4.1.1.2.1 M interface (Management SAP)

The M interface may include, but is not limited to primitives related to:
- System configuration
- Monitoring Statistics
- Notifications/Triggers

14.4.1.1.2.1 R interface (Control SAP)

The R interface may include, but is not limited to primitives related to:
- Handovers (e.g. notification of HO request from MS, etc.)
- Idle mode mobility management (e.g. Mobile entering idle mode)
- Subscriber and session management (e.g. Mobile requesting session setup)
- Radio resource management, etc.

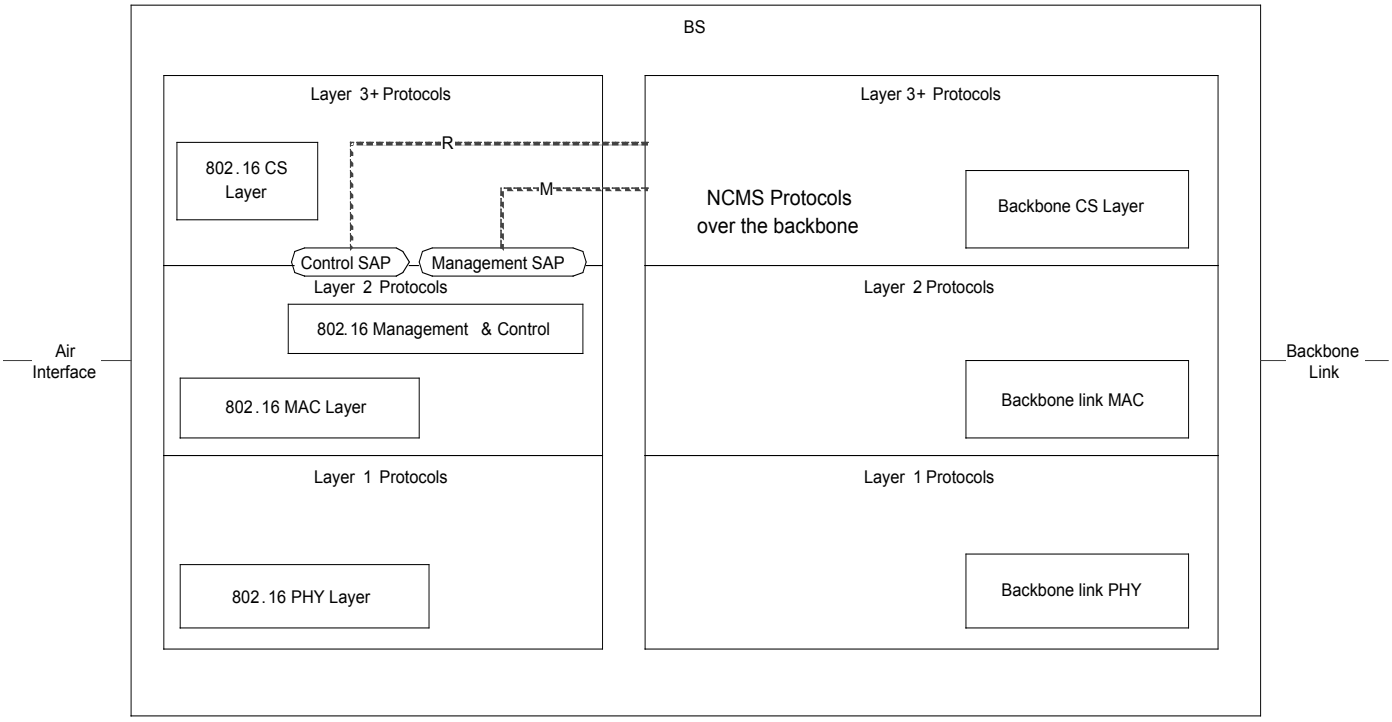


Figure x - Illustration of 802.16 g SAP interfaces within the BS

6 References

[1] IEEE P802.16e_D6 specification
[2] IEEE 802.16-2004 specification
[3] IEEE P802.16g baseline document http://ieee802.org/16/netman/docs/80216g-04_03r1.pdf