Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Some changes of MAC management messages for a byte alignment
Date Submitted	**2005-05-03**
Source(s)	Yeongmoon Son, HyoungKyu Lim, Hyunjeong Kang Aeri Lim Samsung Electronics Co. Ltd. Voice: +82-31-279-5845 FAX. : +82-31-279-5130 ym1004.son@samsung.com
Re:	IEEE P802.16e/D7-2004
Abstract	This contribution proposes some changes of MAC management messages for a byte alignment.
Purpose	Discuss and adopt proposed text.
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.
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 and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures (Version 1.0) <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, if there is technical justification in the opinion of the standards-developing committee and provided the IEEE receives assurance from the patent holder that it will license applicants under reasonable terms and conditions for the purpose of implementing the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:r.b.marks@ieee.org > as early as possible, in written or electronic form, of any patents (granted or under application) that may cover technology that is under consideration by or has been approved by IEEE 802.16. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

Some changes of MAC management messages for a byte alignment

Yeongmoon Son, HyoungKyu Lim, Hyunjeong Kang
Aeri Lim

Samsung Electronics Co. Ltd

1 Problem Statement

In IEEE P802.16e/D7 and IEEE P802.16REVd/D5, the length of MAC PDU is presented in unit of byte with LEN field in generic MAC header which is included in MAC Frame. As a result, MAC SDU following the generic MAC header shall have the length in unit of byte. But, Some of MAC Management messages do not observe the rule of byte alignment. Therefore, they need some changes for a byte alignment. It would be helpful for developer to implement the system of IEEE P802.16e/D7 and IEEE P802.16REVd/D5.

- Alignment criteria for MAC messages
  i. Each MAC message shall be byte-aligned.
  ii. Byte-alignment shall be maintained before the HMAC/OMAC tuple or the TLV encodings since an HMAC/OMAC tuple or TLV encodings come at the end of the message and are themselves byte-aligned.

2 Proposed Text

We propose some changes of MAC management message for a byte alignment.

[Modify the table 108d – Sleep-Response (MOB_SLP-RSP) message format of IEEE802.16e/D7 document as follows.]

Table 108d—Sleep-Response (MOB_SLP-RSP) message format

Syntax	Size	Notes
MOB_SLP-RSP_Message_Format() {		
Management message type = 51	8 bits	
Number of Classes	8 bits	Number of power saving classes.
for (i = 0; i < Number_of_Classes; i++) {		
Length of Data	8 bits	
Definition	1 bit	
Operation	1 bit	
Power_Saving_Class_ID	6 bits	
if (Operation = 1) {		
Start_frame_number	6 bits	
Reserved	2 bits	
} else {		
REQ-duration	8 bits	
}		
if (Definition = 1) {		

Power_Saving_Class_Type	2 bits	
Direction	2 bits	
if (Sleep-approved == 0) {		
REQ-duration	8 bits	
}		
initial-sleep window	8 bits	
listening window	8 bits	
final-sleep window base	10 bits	
final-sleep window exponent	3 bits	
TRF-IND required	1 bit	
Traffic_triggered_wakening_flag	1 bit	
Reserved	1 bit	
if(TRF-IND required) {		
SLPID	10 bits	
Reserved	2 bits	
}		
Number_of_CIDs	4 bits	
for (i = 0; i < Number_of_CIDs; i++) {		
CID	16 bits	
}		
if (SHO or FBSS capability enabled) {		
Maintain Active Set and Anchor BS ID BSID	1 bit	
if (Active Set and Anchor BS ID BSID main-tained) {	3 bits	
SHO/FBSS duration (s)		
}		
}		
}		
Padding	Variable	If needed for alignment to byte boundary
if (Operation = 1) {		
Power Saving Class TLV encoded information		
}		
~~**Padding**~~	~~Variable~~	~~If needed for alignment to byte boundary~~
}		
TLV encoded information		
}		

[Modify the table 108h – MOB_SCN-REQ message format of IEEE802.16e/D7 document as follows]

Table 108h—MOB_SCN-REQ message format

Syntax	Size	Notes
MOB_SCN-REQ_Message_Format() {		
Management Message Type = 54	8	
Scan type	1	

Interleaving interval	8	
Scan Iteration	8	
N_Recommended_BS_scanning	3	
For(j=0;j<N_Recommended_BS_Scanning;j++){		
~~**N_Recommended_BS_scanning**~~	~~3~~	
Recommended BS ID Scanning	48	
}		
If(Scan type = 1) {		
N_Recommended_BS_Associations	4	
For(j=0;j<N_Recommended_BS_Scanning;j++){		
Recommended BS ID Association	48	
}		
~~**HMAC Tuple**~~	~~**21 bytes**~~	
}		
Padding	**variable**	If needed for alignment to byte boundary
HMAC Tuple	**21 bytes**	
}		

[Modify the table 108i – MOB_SCN-RSP message format in Page 96 of IEEE802.16e/D7 document as follows, i.e. remove one of the two reserved fields and change the size for byte alignment. In addition, move the HMAC Tuple to the end of a message and correct the size to 21 bytes]

Table 108i—MOB_SCN-RSP message format

Syntax	Size	Notes
MOB_SCN-RSP_Message_Format() {		
Management Message Type = 55	8 bits	
Scan duration	8 bits	in frames
if (Scan Duration ==0) {		
HMAC Tuple	21 bytes	
} else {		
Start frame	4 bits	
Scan_type	1 bit	0: Scanning 1: Association
Reserved	~~7~~ 5 bits	Shall be set to zero.
Interleaving interval	8 bits	Duration in frames
Scan iteration	8 bits	
Report mode	2 bits	0b00 : no report 0b01 : periodic report 0b10 : event triggered report 0b11 : reserved
Scan report period	8 bits	Available when the value of Scan Report is set to 0b01. Scan report period in frames.
~~*reserved*~~	~~2 bits~~	~~Shall be set to zero.~~
N_Recommended_BS_String	4 bits	

For (j=0; j<N_Recommended_BS_Scanning; j++) {		N_Recommended_BS can be derived from the length field in the MAC header of the message
Recommended BS ID Scanning	48 bits	BS IDs of Available BS for Association
}		
If (Scan type = 1) {		
N_Recommended BS_Association	4 bits	
For (j=0; j<N_Recommended_BS_Associations; j++) {		
Recommended BS ID Association	48 bits	
Rendevouz_time	16 bits	
}		
~~**HMAC Tuple**~~	~~16 bits~~	
}		
HMAC Tuple	**21 bytes**	
}		
}		

[Modify the table 108i – MOB_SCAN-REPORT message format of IEEE802.16e/D7 document as follows, i.e. add Reserved bits for byte alignment]

Table 108l—MOB_SCAN-REPORT message format

Syntax	**Size**	**Notes**
MOB_SCAN-REPORT_Message_Format() {		
Management Message Type = 60		
Report Mode	1 bit	00 0: Event-triggering 1: reserved
Reserved	6 bits	
Comp_NBR_BSID_IND	1 bit	
if (Comp_NBR_BSID_IND == 1){		
Configuration Change Count for MOB_NBR_ADV	8 bits	Configuration Change Count value of referring MOB_NBR_ADV message
}		
N_NEIGHBORS	8 bits	
for (i=0; i<N_NEIGHBORS; i++) {		
if (Comp_NBR_BSID_IND == 1){		
Neighbor BS index	8 bits	
}		
else{		
Neighbor BSID	24 bits	The least significant 24 bits of the Neighbor BSID
}		

BS CINR mean	8 bits	
BS RSSI mean	8 bits	
Relative delay	8 bits	
}		
}		

[Remove the Resource Retain Type and the TLV encoded information fields in the table 108k – MOB_BSHO-REQ message format in Line 48, Page 104 of IEEE802.16e/D7 document which are duplicated]

Table 108k—MOB_BSHO-REQ message format

Syntax	Size	Notes
MOB_BSHO-REQ_Message_Format() {		
Management Message Type = 56	8 bits	
…		
~~**Resource Retain Type**~~	~~**1**~~	
~~**TLV encoded information**~~	~~**Variable**~~	
Action time	**7**	
Resource Retain Type	**1**	
padding	**Variable**	
TLV encoded information	**Variable**	
HMAC Tuple	**168**	
}		

[Modify table 108i - MOB_MSHO-REQ message format of IEEE802.16e/D7 document as follows.]

Table 108i—MOB_MSHO-REQ message format

Syntax	Size	Notes
MOB-_MSHO-REQ_Message_Format() {		
Management Message Type = 57	8 bits	
…		
Estimated HO start	8	
Padding	Variable	
HMAC Tuple	168	
~~Padding~~	~~Variable~~	
}		

[Change the size of Padding from 0 or 4 to variable in the table 108n – MOB_HO-IND message format in Line 19, Page 117 of IEEE802.16e/D7 document]

Table 108n—MOB_HO-IND message format

Syntax	Size	Notes
MOB_HO-IND_Message_Format() {		
Management Message Type = 59	8 bits	
…		
Padding	~~0 or 4~~ variable	Padding bits to ensure byte aligned. Shall be set to zero.
HMAC Tuple	21 bytes	See 11.1.2
}		

[Modify the table 108o – BS Broadcast Paging (MOB_PAG-ADV) message format of IEEE802.16e/D7 document as follows]

Table 108o—BS Broadcast Paging (MOB_PAG-ADV) message format

Syntax	Size	Notes
MOB_PAG-ADV_Message_Format() {		
Management Message Type=62	8 bits	
Num_Paging_Group_IDs	8 bits	Number of Paging Group IDs in this message
for (i=0; i<Num_Paging_Group_IDs; i++) {		
Paging Group ID	8 bits	
}		
Num_MACs	8 bits	Number of MS MAC addresses
for (j=0; j<Num_MACs; j++) {		
MS MAC Address hash	24 bits	The hash is obtained by computing a CRC24 on the MS 48-bit MAC address. The polynomial for the calculation is 0x864CFB
Action Code	2 bit	Paging action instruction to MS 00=No Action Required 01=Perform Ranging to establish location and acknowledge message 10=Enter Network 11=reserved
Reserved	6 bits	
}		

padding	variable	Padding bits to ensure byte aligned.
TLV Encoded Information	variable	TLV specific
~~*padding*~~	~~variable~~	~~Padding bits to ensure octet aligned~~
}		