Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>	
Title	**United TLV encoding for PSC parameters in RNG-REQ/RSP**	
Date Submitted	**2008-03-10**	
Source(s)	Yeongmoon Son, Geunhwi Lim, Brian Shim Samsung Electronics*	Voice: E-mail: ym1004.son @samsung.com *<http://standards.ieee.org/faqs/affiliationFAQ.html>
Re:	LB26b	
Abstract	This contribution proposes the united TLV encoding which can accommodate whole PSC parameters without Type and Length field in RNG-REQ/RSP message	
Purpose	Accept the proposed specification changes on IEEE P802.16Rev2/D3.	
Notice	*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.	
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>.	

United TLV encoding for PSC parameters in RNG-REQ/RSP

Samsung Electronics

Problem description

When MS or BS include PSC parameters TLV encoding in RNG-REQ/RSP message, most of the TLV encodings are included in Power Saving Class Parameters compound TLV encoding. In this case, Type and Length field are useless and meaningless any more. They are big overhead in RNG-REQ/RSP message which are transmitted on a burst with robust MCS level.

Type	Length	Value
21 or 27	Variable	Power Saving Class Parameters (Compound TLV)

Table 623—Power saving class parameters

Name	Type (1 byte)	Length	Value (variable length)
Flags	1	1	Bit 0: Definition: 0 = Definition of Power Saving Class absent 1 = Definition of power saving class present. Bit 1: Operation: 0 = Deactivation of power saving class. 1 = Activation of Power Saving Class. Bit 2: TRF-IND_Required flag for power saving class type I only: 1 = BS shall transmit at least one TRF-IND message during each listening window of the power saving class. This bit shall be set to 0 for other types. Bit 3: Stop_CQI_Allocation_Flag 1 = Any CQICH allocations to this MS are cancelled. 0 = CQICH allocations to this MS are still allocated and the MS shall continue to transmit channel quality information on them during its availability intervals. Bits 4–7: *Reserved*
Power_Saving_Class_ID	2	1	Assigned power saving class identifier. Not used for RNG-REQ message.
Power_Saving_Class_Type	3	1	Power saving class type as specified in 6.3.2.3.
Start_frame_number	4	1	Start frame number for first sleep window. Not used for RNG-REQ message.
initial-sleep window	5	1	Initial sleep window.
listening window	6	1	Assigned duration of MS listening interval (measured in frames).
final-sleep window base	7	1	Assigned final value for sleep interval (measured in frames)—base.
final-sleep window exponent	8	1	Assigned final value for sleep interval (measured in frames)—exponent.
SLPID	9	1	A number assigned by the BS whenever an MS is instructed to enter sleep mode.
CID	10	2	Connection identifier to be included into the power saving class. There may be several TLV's of this type in a single compound Power Saving Class Parameters TLV.
Direction	11	1	Direction for management connection, which is added to power saving class.

Proposed Changes

If we use the united TLV, we can reduce at least 32 bytes overhead(over-50% reduction) in case of PSC Type I. the united TLV has the same format as MOB_SLP-REQ/RSP (i.e. no missing parameters).

[At the end of table 550 on page 1078, line 18, define new TLV encoding(i.e. United TLV encoding) which includes only values of other TLV encodinsgs in table 550 without Type and Length field, as follows]

Table 623—Power saving class parameters

<table>
<tr><th>Name</th><th>Type
(1 byte)</th><th>Length</th><th>Vlaue
(Variable-Length)</th></tr>
<tr><td>…</td><td>…</td><td>…</td><td></td></tr>
<tr><td>Direction</td><td>11</td><td>1</td><td>Direction for management connection, which is added to power saving class.</td></tr>
<tr><td>Unified TLV encoding for Power Saving Class Parameters</td><td>12</td><td>Variable</td><td>MS may use this TLV encoding instead of the above TLV encoding
<table>
<tr><th>Parameters</th><th>Bits</th></tr>
<tr><td>Operation</td><td>1</td></tr>
<tr><td>Definition</td><td>1</td></tr>
<tr><td>Power_Saving_ClassID</td><td>6</td></tr>
<tr><td>If(Operation == 1) {</td><td></td></tr>
<tr><td>Start_Frame_Number</td><td>7</td></tr>
<tr><td>Stop_CQI_Allocation_Flag</td><td>1</td></tr>
<tr><td>}</td><td></td></tr>
<tr><td>If(Definition) {</td><td></td></tr>
<tr><td>Power_Saving Class Type</td><td>2</td></tr>
<tr><td>TRF-IND_Required</td><td>1</td></tr>
<tr><td>Traffic_Triggered_Wakening_flag</td><td>1</td></tr>
<tr><td>Direction</td><td>2</td></tr>
<tr><td>MDHO/FBSS_Support</td><td>1</td></tr>
<tr><td>Initial-Sleep Window</td><td>8</td></tr>
<tr><td>Listening-Window</td><td>8</td></tr>
<tr><td>Final Sleep Window base</td><td>10</td></tr>
<tr><td>Final Sleep Window exponent</td><td>3</td></tr>
<tr><td>If(TRF-IND_Required == 1) {</td><td></td></tr>
<tr><td>SLPID</td><td>10</td></tr>
<tr><td>Reserved</td><td>2</td></tr>
<tr><td>}</td><td></td></tr>
<tr><td>Number_of_CIDs</td><td>4</td></tr>
<tr><td>For(i=0; i< Number_of_CIDs; i++) {</td><td></td></tr>
<tr><td>CID</td><td>16</td></tr>
</table>
</td></tr>
</table>

			}	
			If(MDHO/FBSS_Support == 1)	
			MDHO/FBSS duration(s)	3
			Reserved	1
			}	
			}	
			Padding for byte alignment	0 or 4

References

[IEEE802.16-Rev2/D3] IEEE Computer Society and IEEE Microwave Theory and Techniques Society, “DRAFT Standard for Local and Metropolitan Area Networks Part 16: Air Interface for Broadband Wireless Access Systems”, P802.16Rev2/D3 (February 2008). Revision of IEEE Std 802.16-2004 and consolidates material from IEEE Std 802.16e-2005, IEEE Std 802.16-2004/Cor1-2005, IEEE Std 802.16f-2005 and IEEE Std802.16g-2007.