Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Changes to remove "CRC appended" field in compressed DL-MAP
Date Submitted	**2004-07-07**
Source(s)	Intel Yuval Lomnitz yuvall@envara.com Yigal Eliaspur yigal.eliaspur@intel.com Voice: +972-547-884877
Re:	IEEE P802.16e/D3-2004
Abstract	Changes to remove "CRC appended" field in compressed DL-MAP, which is redundant and may cause mis-identification of a bit error.
Purpose	
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 <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of 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:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

Changes to remove "CRC appended" field in compressed DL-MAP
Yuval Lomnitz

1.   Motivation

The field "CRC appended" is erronous, as explained below. The change we propose is backward compatible.

2.   Details

The field "CRC appended" controls the inclusion of CRC at the end of the compressed MAP. Normal MAPs always have CRC as they are MAC broadcast management messages (see 6.3.2.3).

(1) The standard defines "DL synchronization" as being able to decode the DL-MAP (see 6.3.9.2). It is difficult to define synchronization if the MAP doesn't include CRC, as it's difficult to tell if the MAP was received correctly. MAC timers and processes are based on the notion of DL synchronization.
(2) A frame that is sent with "CRC appended" set to 1 may suffer errors that will invert the status of this bit. In regular MAC messages, the HCS over the GMH protects the "CRC appended" bit, however in compressed maps there is no protection, so a combination of two bit errors, one of which is on the "CRC appended" field, may cause the error not to be detected.
(3) being a broadcast management message, it stands to reason that the rule that applies to normal MAC messages (6.3.2.3) regarding CRC inclusion will also apply in this case.

3.   Changes summary

[In P802.16e-D3, p.79, line 1, add following text, between BEGIN and END]:

BEGIN

8.4.5.6.1 Compressed DL-MAP
[Make the following change in table 303]

Table 303—Compressed DL-MAP message format

Syntax	Size	Notes
Compressed_DL-MAP() {		
Compressed map indicator	2 bits	Set to binary 11 for compressed format
reserved	1 bit	Shall be set to zero
UL-MAP appended	1 bit	
~~CRC appended~~ *reserved*	1 bit	Shall be set to zero
Map message length	11	
PHY Synchronization Field	32 bits	
DCD Count	8 bits	
Operator ID	8 bits	
Sector ID	8 bits	

DL IE count	8 bits	
for (*i* = 1; *i* <= DL IE count; *i*++) {		
DL-MAP_IE() *variable*		
}		
if !(byte boundary) {		
Padding Nibble	4 bits	Padding to reach byte boundary.
}		
CRC	32 bits	
}		

[change the text in p.551, lines 59-65 as follows]:

CRC ~~appended~~

~~A value of one indicates a~~ CRC-32 value is appended to the end of the compressed map(s) data. The CRC is computed across all bytes of the compressed map(s) starting with the byte containing the Compressed map indicator through the last byte of the map(s) as specified by the Map message length field. The CRC calculation is the same as that used for standard MAC messages. ~~A value of zero indicates that no CRC is appended.~~

[move the above paragraph to the end of the field descriptions].

2