

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Clarification of CQICH allocation request header	
Date Submitted	2005-04-27	
Source(s)	Yongseok Jin, Bin-Chul Ihm, Jin Young Chun, and Ki-seon Ryu LG Electronics. Inc.	Voice: 82-31-450-7187 Fax: 82-31-450-7129 jayjay@lge.com
Re:	This is a contribution to IEEE 802.16e.	
Abstract	In the case that MS requests CQICH bandwidth to report the data that are much longer than 4 or 6bit, this becomes impossible because data must be transmitted over a CQI channel which is based on 4 or 6 bits.	
Purpose	We suggest to add a new table which consists of the feedback contents only transmitted over CQICH for feedback type of this header	
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 >.	

Clarification of CQICH allocation header

*Yongseok Jin, Bin-Chul Ihm, Jinyoung Chun, and Ki-seon Ryu
LG Electronics Inc.*

Introduction

MS uses CQICH allocation request header when the MS has reporting feedback values like in the table 7i. The reporting feedback values should be encoded 4 or 6bits and transmitted over CQICH (Fast feedback channel). However, when MS requests CQICH to report feedback contents that are much longer than 4 or 6bits like in the red box, it becomes not compatible with current control operation of CQICH (Fast feedback channel) thus BS can not understand what MS reports.

Feedback Type (binary)	Feedback contents	Description
0000	Set as described in Table 296d	MIMO mode and permutation feedback
0001	DL average CQI (5 bits)	5 bits CQI feedback
0010	Number of index, L (2 bits) + L occurrences of Antenna index (2 bits) + MIMO coefficients (5 bits, 8.4.5.4.10.6)	MIMO coefficients feedback
0011	Preferred-DIUC (4 bits)	Preferred DL channel DIUC feedback
0100	UL-TX-Power (7 bits) (see Table 7a)	UL transmission power
0101	Preferred DIUC(4 bits) + UL-TX-Power(7 bits) + UL-headroom (6 bits) (see Table 7a)	PHY channel feedback
0110	Number of bands, N (2 bits) + N occurrences of 'band index (6 bits) + CQI (5 bits)'	CQIs of multiple AMC bands
0111	Number of feedback types, θ (2 bits) + θ occurrences of 'feedback type (4 bits) + feedback content (variable)'	Multiple types of feedback
1000	Feedback of index to long term precoding matrix in code book (6 bits), rank of precoding code book (2 bits) and FEC and QAM feedback (6 bits) according to Table Z.	Long term precoding feedback
1001	Life span of short term precoding feedback (4 bits) according to Table Z2.	The recommended number of frames the short term precoding feedback can be used for.
1000	Combined CQI of Active BSs (5 bits).	Combined CQI value of all Active BSs within the Active Set.
1011	MIMO channel feedback (see Table 7k)	MIMO mode channel condition feedback
0b1011	CINR Mean (8 bits) + CINR Standard Deviation (8 bits)	CINR Feedback (values and coding defined in 8.4.11.5).
1100-1111	Reserved for future use	—

Table – Feedback values much longer than 4 or 6bits in the table 7i

To solve the problem above, we suggest to add a new table-7x which consists of the feedback contents transmitted over CQICH. Moreover, the new table includes that 'Anchor BS report' field for Fast Anchor BS selection Feedback mechanism In addition, in order that MS requests BS to allocate Fast-feedback channel with period which MS prefer, we add 'Preferred-Period'.

Suggested Changes

[To clarity, add new table and new field in the section 6.3.2.1.2.3]

6.3.2.1.2.3 CQICH Allocation Request Header

The CQICH Allocation request PDU shall consist of CQICH Allocation request header alone and shall not contain a payload. The CQICH Allocation request header is illustrated in Figure 20d

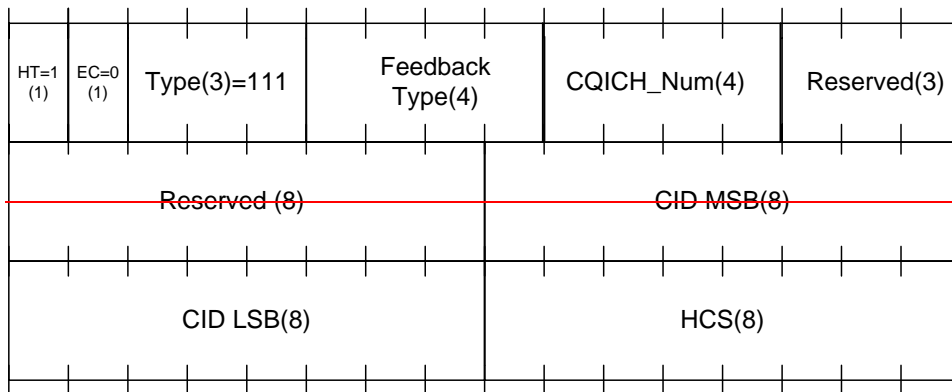


Figure 20d—CQICH Allocation Bandwidth request

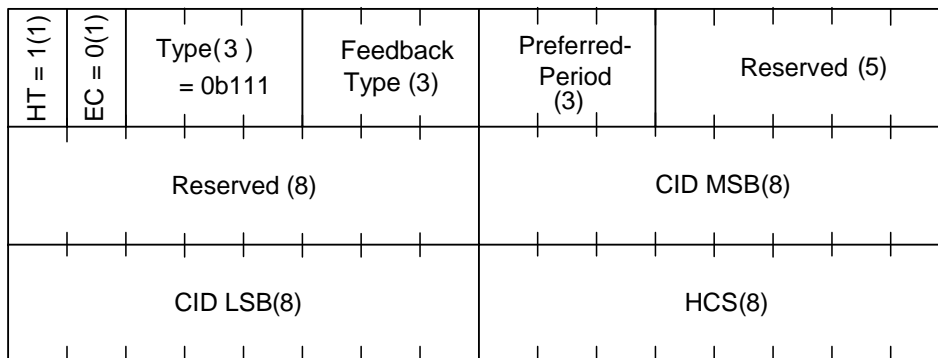


Figure 20d—CQICH Allocation request header

The CQICH Allocation request header shall have the following properties:

- a) The length of the header shall always be 6 bytes.
- b) The EC field shall be set to 0, indicating no encryption.
- c) The CID shall indicate the MS basic CID.
- d) The Type field shall be 0b111.

The fields of the CQICH Allocation request header are defined in Table 7c

Table 7c – Description of the fields of CQICH Allocation Request Header

Name	Length(bits)	Description
HT	1	Header Type =1
EC	1	Always set to zero
Type	3	Set according to Table 7i Type = 0b111
Feedback type	3	Set according to Table 7x
CQICH_Num	4	The number of CQICH requested by MS
Preferred-Period(=p)	3	CQICH allocation period MS prefer. The value is defined by 2^p frame.
RSVD	12-13	Set to zero
CID	16	MS basic CID
HCS	8	Header Check Sequence (same usage as HCS entry in Table 5)

[Table 7x – Feedback type and feedback contents](#)

Feedback type	Feedback contents	Description
000	Fast DL measurement	Average S/N or individual layer S/N in MIMO
001	Quantized Precoding weight	The desired antenna weight
010	MIMO mode feedback	MIMO mode and permutation selection
011	Anchor BS report	Select Anchor BS
100-111	Reserved	Set to zero