

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	DL-MAP and UL-MAP CID Table IEs with Multiple DL MAPs	
Date Submitted	2005-01-12	
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Re:	Response to Sponsor Ballot on IEEE802.16e/D5a document	
Abstract	The proposed DL-MAP and UL-MAP CID table IEs can be used to not only improve DL subframe efficiency but also significantly reduce unnecessary power consumption.	
Purpose	To incorporate the text changes proposed in this contribution into the 802.16e/D6 draft.	
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DL-MAP and UL-MAP CID Table IEs

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1. Problem Statement

According to current standard draft IEEE P802.16e-D5a-2004, MAP messages are used to perform DL and UL allocation to the MSSs. The current MAP format for OFDMA mode presents the following two problems:

- **Excessive power consumption:** As defined in the current 802.16e standard, a MSS has to, at the minimum, finish listening to the whole DL-MAP and UL-MAP regardless there is DL traffic or UL traffic for the MSS in the current frame.
- **Extensive overhead on DL for MAP messages:** As defined in the current 802.16e standard, the DL data burst allocation can optionally include the list of CIDs designated. However, if the list of CIDs is not included in the DL MAP, it imposes a high requirement on MSS's processing power and drastically increase the MSS's battery consumption. To reduce MSS processing complexity and prolong battery life, the list of CIDs should always be included in the DL-MAP for the mobile network. However, when the CIDs are included, there can extensive overhead on DL caused by DL MAP transmission since the size of DL-MAP can be very large.

2. Proposed Solutions

To overcome the problems mentioned above, we would like to propose the following solution:

- Introduce a reduced CID format for DL-MAP-IE in SUB-DL-UL-MAP

3. Specific Text Changes

[Modify the following section:]

6.3.2.3.59 Sub downlink/uplink map (SUB-DL-UL-MAP) message

.....

Syntax	Size	Notes
SUB-DL-UL-MAP () {		
Compressed map indicator	3 bits	Set to binary 111
Map message length	10 bits	
Reserved	2 bits	Shall be set to 0
H-ARQ ACK offset indicator	1 bit	
If (H-ARQ ACK offset indicator == 1){		
DL H-ARQ ACK offset	8 bits	
UL H-ARQ ACK offset	8 bits	
}		
<u>RCID_Type</u>	<u>2 bits</u>	<u>00 = Normal CID</u> <u>01 = RCID11</u> <u>10 = RCID7</u>

		11 = RCID3
DL IE Count	8 bits	
For (i=1; i <= DL IE Count; i++)		
DL-MAP_IE()	Variable	
}		
UL starting slot offset	11 bits	
Reserved	2 bits	Shall be set to 0
while (map data remains){		
UL-MAP_IE()	Variable	
}		
If !(byte boundary) {		
Padding Nibble	Variable	Padding to reach byte boundary.
}		
}		

DL H-ARQ ACK offset

Indicates the ACK bit index in the DL H-ARQ ACK IE that corresponds to the first H-ARQ enabled downlink burst specified in this map message.

[RCID TYPE: CID format used by all DL MAP allocation IEs.](#)

DL IE Count

The number of DL-MAP_IE-s.

[Modify the following section:]

Table 273—OFDMA DL-MAP_IE format

Syntax	Size	Notes
DL_MAP_IE () {		
DIUC	4 bits	
if (DIUC == 15) {		
Extended DIUC		dependent IE variable See clauses following 8.4.5.3.1
} else {		
if (INC_CID == 1) {		The DL-MAP starts with INC_CID =0. INC_CID is toggled between 0 and 1 by the CID-SWITCH_IE() (8.4.5.3.7)
N_CID	8 bits	Number of CIDs assigned for this IE
for (n=0; n< N_CID; n++) {		
If (included in SUB-DL-UL-MAP) {		
RCID_IE()		For SUB-DL-UL-MAP, reduced CID format is used
}		
} else {		
CID	16bits	
}		
}		
.....		

4. References

- [1] IEEE 802.16- 2004 IEEE Standards for local and metropolitan area networks part 16: Air interface for fixed broadband wireless access systems
- [2] IEEE P802.16e-D5a-2004