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Date Submitted	2004-05-19	
Source(s)	<p>Sunny Chang, Changhoi Koo Taein Hyon, Yunsang Park</p> <p>Samsung Electronics 416, Maetan-3dong, Paldal-gu Suwon-si, Gyeonggi-do Korea</p>	<p>Voice: [+82-31-279-5091] Fax: [+82-31-279-5130] <a href="mailto:sunny94@samsung.com">sunny94@samsung.com</a>, <a href="mailto:chkoo@samsung.com">chkoo@samsung.com</a>, <a href="mailto:taein.hyon@samsung.com">taein.hyon@samsung.com</a>, <a href="mailto:yunsang.park@samsung.com">yunsang.park@samsung.com</a></p>
Re:		
Abstract	This contribution proposes method for shortening the MOB_TRF_IND message in IEEE 802.16e/D2-2004.	
Purpose	Discuss and adopt enhanced feature of 802.16e/D2.	
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# Method for shortening the MOB\_TRF\_IND message through reducing size of the CID field by replacing it with a Short Basic CID

*Sunny Chang, Changhoi Koo, Taein Hyon, Yunsang Park  
Samsung Electronics*

## 1. Problem Statement

The MOB\_TRF-IND message is structured as follows. MOB\_TRF-IND message can be formed based on either the SLPID or Basic CID. This document proposes a message reduction method which can be applied to the MOB\_TRF-IND message, which is based on Basic CID.

The following figure appears MOB\_TRF-IND message in IEEE802.16e system.

Syntax	Size	Notes
MOB-MOB_TRF-IND_Message_Format(){		
Management message type = 48	8 bits	
FMT	1 bit	0=SLPID based format, 1=CID based format
if(FMT==0){		
SLPID bit-map	Variable	
}else{		
Num-pos	7 bits	Number of CIDs on the positive indication list
for(i=0; i<Num-pos; i++){		
CID	16 bits	Basic CID of the SS
}		
}		
}		

Fig. 1 MOB\_TRF-IND message

When forming an MOB\_TRF-IND message based on CID (FMT=1), the BS includes the Basic CID in the message to notify whether new traffic is generated for the corresponding SS.

The following figure depicts the range of the CID according to their usage.

Connection Identifier	Value	Description
Initial Ranging	0x0000	Used by an SS during initial ranging as part of initial ranging processes
Basic CID	0x0001 ~ m	
Primary management	m+1 ~ 2m	
Transport CIDs and Secondary Mgt CIDs	2m+1 ~ 0xFEFF	
Multicast Polling CIDs	0xFF00 ~ 0xFFFF	An SS may be included in one or more multicast groups for the purposes of obtaining bandwidth via polling. These connections have no associated Service Flow.
Padding CID	0xFFFFE	Used for transmission of padding information.
Broadcast CID	0xFFFF	Used for broadcast information that is transmitted on a downlink to all SS.

Fig. 2 Connection Identifiers

## 2. Proposed Remedy

The length of each Basic CID is 16 bits and its range is between 0x0001 and m, where m is the maximum number of SS's that can be supported. m may assume different values for each BS and the range is usually between 200 and 1000. For example, if m is 255 the range of Basic CID can be represented by values between 0x0001 and 0x00ff, which means that the Basic CID's can be distinguished by using only the lower 8 bits. Thus, instead of using all 16 bits to represent the Basic CID, it would be possible to express the whole range by using a Short Basic CID that uses only the lower 8 bits. By reducing the lengths of the Basic CID's the total message size has the potential to be reduced significantly.

However, since the value of m can differ from BS to BS, the number of bits needed to represent a Short Basic CID may vary. To indicate the length of the Short Basic CID, a 4-bit CID\_length field is necessary. Since the CID\_length field is 4 bits, it can assume values from 0 to 15, where the value '0' means that the Short Basic CID can be represented with 1 bit, '1' means that the Short Basic CID can be represented with 2 bits, and '15' means that the Short Basic CID can be represented with 16 bits.

The following figure describes the proposed MOB\_TRF-IND message format.

Syntax	Size	Notes
MOB-MOB_TRF-IND_Message_Format(){		
Management message type = 48	8 bits	
FMT	1 bit	0=SLPID based format, 1=CID based format
if(FMT==0){		
SLPID bit-map	Variable	
}else{		
Num-pos	7 bits	Number of CIDs on the positive indication list
CID_length	4 bits	Short Basic CID length = CID_length + 1
for(i=0; i<Num-pos; i++){		
Short Basic CID	(CID_length +1) bits	Short Basic CID value obtained from the lower CID_length+1 bits of the Basic CID (i.e. BCID[CID_length:0])
}		
while(!(byte boundary)){		
Padding bits	1 bit	padding for byte align
}		
}		

Fig. 3 Proposed MOB\_TRF-IND message

## 3. Proposed text changes

Table 92c- Table 92c—Traffic-Indication (MOB-TRF-IND) message format

Syntax	Size	Notes
MOB-MOB_TRF-IND_Message_Format(){		
Management message type = 48	8 bits	
FMT	1 bit	0=SLPID based format, 1=CID based format
if(FMT==0){		

SLPID bit-map	Variable	
}else{		
Num-pos	7 bits	Number of CIDs on the positive indication list
<u>CID_length</u>	<u>4 bits</u>	<u>Short Basic CID length = CID_length + 1</u>
for(i=0; i<Num-pos; i++){		
<del>CID</del>	<del>16 bits</del>	<del>Basic CID of the SS</del>
<u>Short Basic CID</u>	<u>(CID_length + 1) bits</u>	<u>Short Basic CID value obtained from the lower CID_length+1 bits of the</u> <u>Basic CID (i.e. BCID[CID_length:0])</u>
}		
<u>while(!(byte boundary)){</u>		
<u>Padding bits</u>	<u>1 bit</u>	<u>padding for byte align</u>
<u>}_</u>		
}		