

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Fragmented Transmission of the MOB-NBR-ADV Message	
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Re:		
Abstract	Propose a mechanism to transmit fragmented MOB-NBR-ADV Message	
Purpose	Adoption of proposed changes into P802.16e /D4-2004	
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1 Introduction

1.1 Problem

Current definition of primary management message does not allow fragmentation of the management message. But the MOB-NBR-ADV message is too long to be transmitted in a single frame.

The maximum size of a message which can be transmitted in a single frame is about 128 bytes when we assume 1024 FFT, 8 symbols for DL, 1/12 coding and QPSK modulation without MAP message overhead. However, the maximum size of MOB-NBR-ADV message is 3061 bytes.

Figure 1 shows the size of MOB-NBR-ADV message depending on the deployment of neighbor cells. Table 1 is the definition of the simulation case. We assume that 6 neighbors exist in 1 tier, 18 neighbors exist in 2 tier. The table shows the distribution of the DCD/UCD message difference. Hence, the DCD/UCD messages of the all neighbors are same in the case 1 and all different in the case 11.

As shown in the Figure 1, the maximum size of the MOB-NBR-ADV message is over 3000 bytes and the minimum size is 600 bytes considering neighbors in two tier.

Table 1 Case Definition

case	1 tier	2 tier
Difference	(0,20,40,60,80,100) %	(0,20,40,60,80,100) %
1	(6,0,0,0,0,0)	(18,0,0,0,0,0)
2	(5,1,0,0,0,0)	(15,3,0,0,0,0)
3	(4,1,1,0,0,0)	(12,3,3,0,0,0)
4	(3,1,1,1,0,0)	(9,3,3,3,0,0)
5	(2,1,1,1,1,0)	(6,3,3,3,3,0)
6	(1,1,1,1,1,1)	(3,3,3,3,3,3)
7	(0,2,1,1,1,1)	(0,6,3,3,3,3)
8	(0,0,3,1,1,1)	(0,0,9,3,3,3)
9	(0,0,0,4,1,1)	(0,0,0,12,3,3)
10	(0,0,0,0,5,1)	(0,0,0,0,15,3)
11	(0,0,0,0,0,6)	(0,0,0,0,0,18)

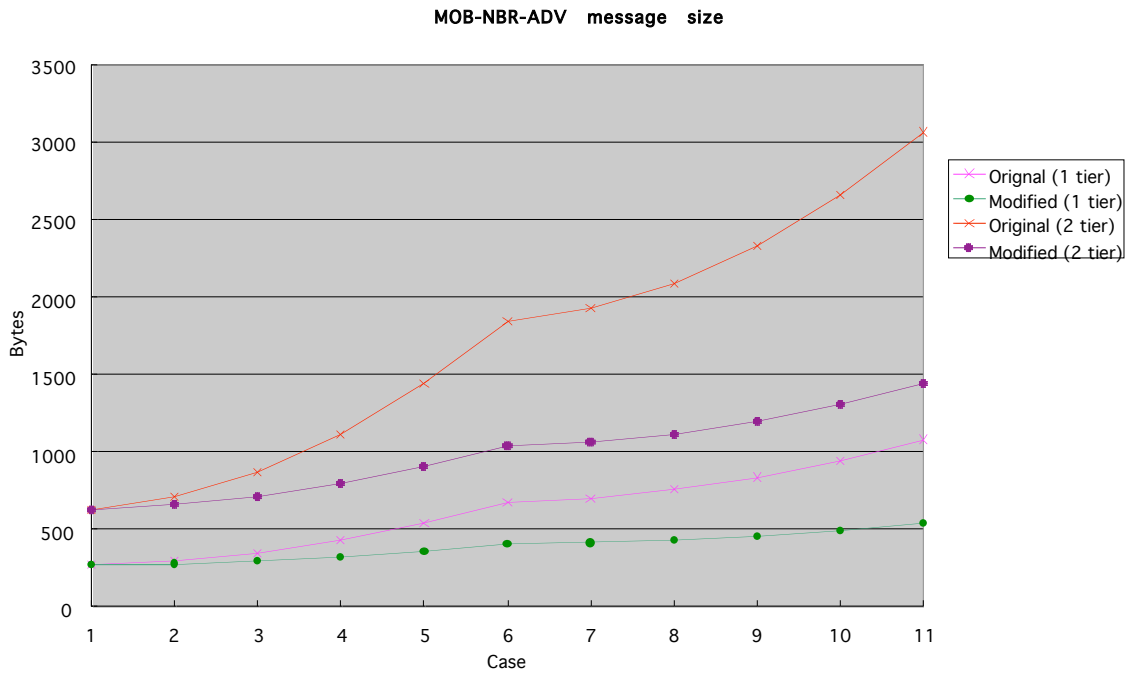


Figure 1 Size of MOB-NBR-ADV Message

1.2 Remedy

Here, we propose a fragmentation mechanism for MOB-NBR-ADV message. By adding Fragmentation Index and Total Fragmentation fields in the MOB-NBR-ADV message we can divide the TLV portion of the message and transmit them over several messages. Hence, the individual message size will be decreases to be sent in a frame. A MSS should receive all the fragments to get the complete information about the neighbors.

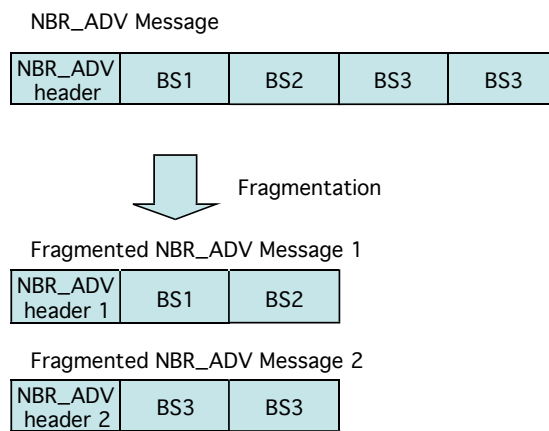


Figure 2 Fragmentation of NBR_ADV Message

2 Proposed Text

Change Table 106d in page 35, line 48 and add following text.

6.3.2.3.47 Neighbor Advertisement (MOB-NBR-ADV) message

BSs supporting mobile functionality shall be capable of transmitting a MOB_NBR-ADV management message at a periodic interval (MOB-NBR-ADV interval, see Table 269a) to identify the network and define the characteristics of neighbor BS to potential MSS seeking initial network entry or hand-over. If neighbor information is not available, this message need not be transmitted.

Table 106d—MOB-NBR-ADV Message Format

Syntax	Size	Notes
MOB-NBR-ADV_Message_Format() {		
Management Message Type = 49	8 bits	
Operator ID	24 bits	Unique ID assigned to the operator
Configuration Change Count.	8 bits	Incremented each time the information for the associated neighbor BS has changed
<u>Fragmentation Mode</u>	<u>1 bits</u>	<u>0 : Remaining fragment indicate mode</u> <u>1 : Total neighbor indicate mode</u>
<u>If (Fragmentation Mode == 1){</u>		
<u>TOT N NEIGHBORS</u>	<u>7 bits</u>	
<u>} else {</u>		
<u>Start bit</u>	<u>1 bit</u>	<u>Set to 1 when the message is the first fragment.</u>
<u>Number of Remaining Fragments</u>	<u>6 bits</u>	
<u>}</u>		
N_NEIGHBORS	8 bits	
For (j=0 ; j<N_NEIGHBORS ; j++) {		
Length	8 bits	Length of message information within the iteration of N NEIGHBOR in bytes.
Neighbor BS-ID	48 bits	
Preamble Index	8 bits	The index for the PHY profile specific preamble. Preamble Index is PHY specific for SCa and OFDMA. The value of Preamble Index shall be ignored and a value of '0x00' shall be used for OFDM PHY
PHY Profile ID	16 bits	TBD
HO Process Optimization	8 bits	
DCD Configuration Change Count	8 bits	This represents the Neighbor BS current DCD configuration change count
UCD Configuration Change Count	8 bits	This represents the Neighbor BS current UCD configuration change count
TLV Encoded Neighbor information	Variable	TLV specific
}		
}		

A BS shall generate MOB-NBR-ADV messages in the format shown in Table 106d. The following parameters shall be included in the MOB-NBR-ADV message unless otherwise noted as an optional item in which case they may be included,

Operator ID

The unique network ID shared by an association of BS

Configuration Change Count

Incremented by one (modulo 256) whenever any of the values relating to any included data element changes. If the value of this count in a subsequent MOB-NBR-ADV message remains the

same, the MSS can quickly disregard the entire message.

TOT N NEIGHBORS

The count of total number of neighbors that are known to the serving BS, and may be advertised in a MOB-NBR-ADV message. The actual number of neighbors advertised in any specific message may be lower than this number based on BS considerations such as scheduling, importance of specific neighbors, etc.

Start bit

This bit set to 1 when BS transmitting the first fragment of the message. When the message is not fragmented this bit shall be set to 1. The value of 0 indicates that the message is the middle or end of fragmented

Number of Remaining Fragments

This field indicates the number of remaining fragments to receive. When the message is no fragmented, this field shall be set to 0.

N_NEIGHBORS

The count of the unique combination of Neighbor BS ID, Preamble Index and DCD advertised in this message.