Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Forcing all MSs to be reset at once
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Re:	IEEE P802.16e/D9
Abstract	This contribution proposes the scheme for forcing all MSs to be reset at once
Purpose	Discuss and adopt this contribution
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Forcing all MSs to be reset at once

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1 Introduction

1.1 Problem Statement

When BS restarts due to some critical problem, MSs should be notified that BS restarts and MS has to perform the Network Entry for the information consistency between MSs and BS. After BS restarts, it doesn't know any information about MSs. Unfortunately, MSs also still try to send or receive a data because they don't know when BS restarted. Therefore, the restart of BS requires the Network Entry of all MSs for information synchronization between MSs and BS.

In current IEEE802.16d and 16e, there is a way for BS to force MS to perform the Network Entry. That is a RES-CMD message. But, this message is sent to MS by BS in unicast manner. Therefore, if BS wants all MSs to perform the Network Entry for clearing the some problem, BS has to send RES-CMD message to each MSS in 'n' times as the number of MSs which belong to BS.

We propose to introduce restart count as the number of times in which BS restarts in order make MSs recognize the BS restart.

1.2 Proposed Solution

We propose the restart count TLV encoding which is included in DCD message.

- Restart Count sent by BS :
  The restart count means the number of times in which BS restarts. This restart count is incremented by one whenever BS restarts. The restart count as TLV encoding is included in DCD message
- Restart Count saved in MS :
  The restart count, which BS sent via DCD message, is saved in MS in order to recognize whether BS restarts or not. Whenever MS receives DCD message from BS, it compare the restart count in DCD message with the old one saved in it. As a result, if MS detects the restart count in DCD message is different from the old one, MS decides to perform the Network Entry. Therefore, MS updates the old restart count with the restart count in DCD message and performs the Network Entry

BS may intentionally increment the restart count to be included in DCD message for the purpose of forcing all MSs to perform the Network Entry due to BS's some problem.
Because the restart count is periodically broadcasted, the restart count scheme is available regardless of MS's state (i.e. normal state, sleep, idle mode)

Figure 1 shows the operation by BS Restart Count TLV encoding in DCD message

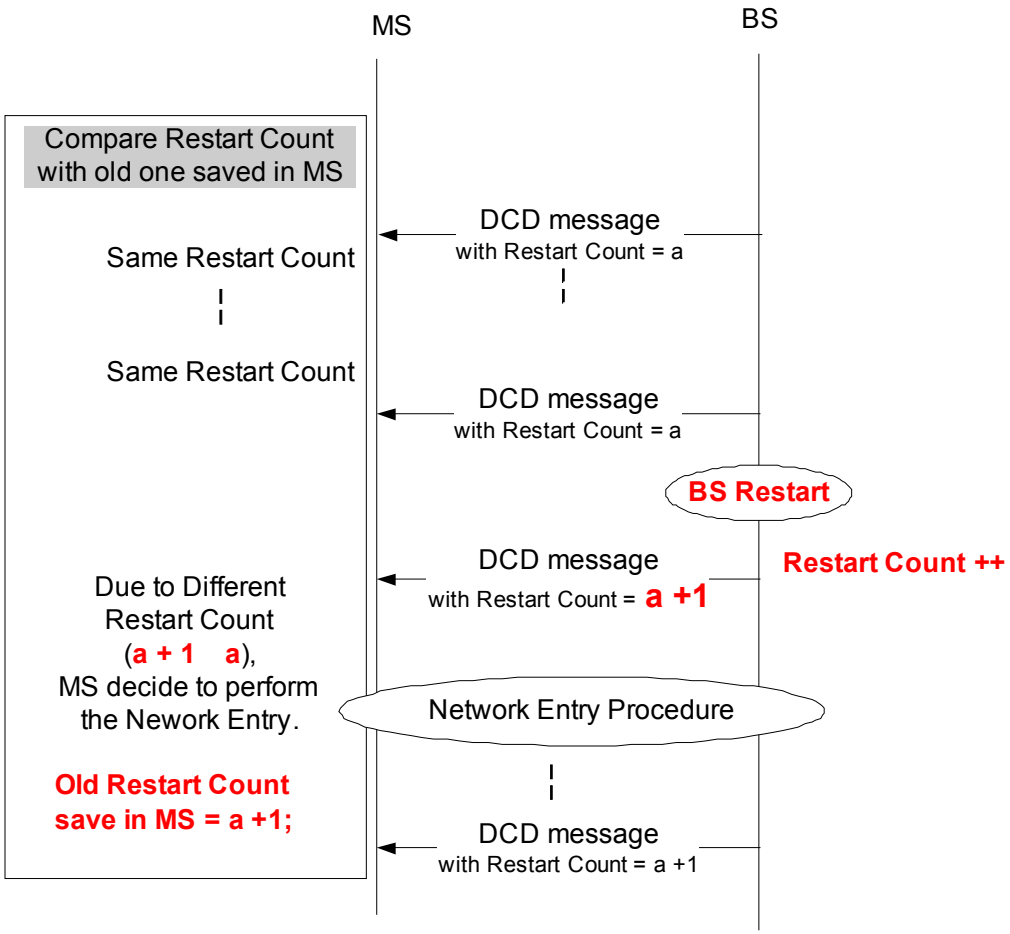

Figure 1 – The Operation by Restart Count TLV encoding in DCD message

2 Proposed Text Change

[Add the following text to Table 358 in Line 41, Page 516 of IEEE P802.16e/D9 document]

Table 358— DCD channel encoding — WirelessMAN-OFDMA

Name	Type (1 byte)	Length	Value (Variable-length)	PHY scope
..	..	..	..	..
Downlink_burst_profile for multiple FEC type	153	1	May appear more than once (see 6.3.2.3.1 and 8.4.5.5). The length is the number of bytes in the overall object, including embedded TLV items.	
BS Restart Count	xx	1	The value is incremented by one whenever BS restarts (see 6.3.9.11). The value rolls over from 0 ~ to 255	All

[Insert the section 6.3.9.11 Forcing MSs to perform Network Entry at once in Line 54, Page 151 of IEEE P802.16e/D9 document as follows]

6.3.9.11 Forcing MSs to perform Network Entry at once

BS may restart due to a critical error or an operator's intention. BS has the restart count as the number of times in which BS restarts. This restart count is incremented by one whenever BS restarts. The restart count as TLV encoding is included in DCD message (refer to table 358). BS may intentionally increment the restart count to be included in DCD message for the purpose of forcing all MSs to perform the Network Entry due to BS's some problem or an operator's purpose.

After BS restarts, BS shall inform MSs of its restart through the incremented restart count in DCD message. The restart count, which BS sent via DCD message, is saved in MS in order to recognize whether BS restarts or not.
Restart count is updated by every BS Restart Count TLV encoding in DCD message sent by BS. In other words, whenever MS receives DCD message, it shall compare the restart count in DCD message with the old one saved in it. If MS detects the restart count in DCD message different from old one save in MS, it shall perform Network Entry.
MOB_NBR-ADV message shall also include the BS Restart Count TLV for neighbor BS in each DCD_settings of DCD message. MS shall save the restart count of each negighbor BS for HO procedure. MS during HO shall compare the restart count of Target BS through DCD message with the restart count of Target BS saved in MS. As a result, if MS detects the restart of Target BS, it shall perform the Network Entry.