

<b>Project</b>	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >
<b>Title</b>	<b>Corrections to DCD/UCD in OFDMA PHY</b>
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<b>Re:</b>	IEEE 802.16d D5 Draft Corrigenda
<b>Abstract</b>	To correct error in 802.16d/D5. In some system, the UCD/DCD message can not be transferred in a frame due to the size of UCD/DCD. This contribution suggests the way to transfer UCD/DCD message.
<b>Purpose</b>	
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# Correction to DCD/UCD in OFDMA PHY

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## 1. Introduction

DCD (Downlink Channel Descriptor) and UCD (Uplink Channel Descriptor) are MAC management messages transmitted on the broadcast connection. UCD and DCD contain TLV encoded values and the length of UCD and DCD is quite long. The UCD message length may be over 280 bytes and DCD message length may be over 200 bytes.

MAC management messages on broadcast, basic or initial ranging connection shall be neither fragmented nor packed. Therefore, even a long MAC management message shall be transmitted at once without fragmentation. The resource allocation for long DCD/UCD message is burden for BS, and the transmission is delayed if there is no available bandwidth. Moreover, available resource in a frame may be less than the required to transmit DCD/UCD. Supposed that OFDMA system with 2ms frame duration and 10MHz bandwidth selects CP duration of 1/4 and FFT size of 2048, the maximum number of symbols in a frame is less than 8. When 1/2 QPSK and 6 repetition coding is used, the maximum resource for data transmission in a frame is 224 bytes totally. Therefore, the transmission of UCD or DCD could not be supported, which means the system will not work.

When one or more values in DCD are changed, BS should increase the CCC (Configuration Change Count) value by one and build a message with the changed information. MSS should receive DCD or UCD to maintain, or initiate the connectivity to network. Although MSS needs only modified information, it receives whole DCD or UCD messages.

## 2. Proposed Remedy

This contribution suggests that DCD and UCD message may be partitioned like MOB\_NBR-ADV. In addition, BS may transmit the modified DCD/UCD message before it transmits unmodified DCD/UCD message.

When some of information in DCD or UCD is changed, BS classifies it by modified information and unmodified information. MSS connected to the network may need only modified information, although MSS initiating the network entry needs all DCD/UCD information not only modified but also unmodified.

BS transmits partitioned DCD/UCD in several frames, if bandwidth is not enough. In this situation, modified information should be transmitted in beginning frames and unmodified information should follow. The CCC should be the same in these frames.

The proposed method works as follow.

Partitioning Status Index in UCD/DCD tells whether the message is partitioned, and whether the partition contains modified information or unmodified information. The end of partition can be identified by partitioning count. The partitioning count starts from 1 and increases by one. Partitioning count 0 means last partition. The partitioning count sets to 0 for the last modified UCD/DCD information and for the last unmodified UCD/DCD information.

### 3. Proposed Changes

**Proposed Text Change:**

[Modify the Table 15 in section 6.3.2.3.1]

Syntax	Size	Notes
DCD Message Format() {		
Management Message Type = 1	8 bits	
Downlink channel ID	8 bits	
Configuration Change Count	8 bits	
<u>TLV Partitioning Status Index</u>	<u>4 bits</u>	<u>0: No partition</u> <u>1: message with the partition containing some modified information. Unmodified information can follow.</u> <u>2: message with only unmodified information</u>
<u>TLV Partitioning Count</u>	<u>4 bits</u>	<u>0: last partition</u> <u>1: first partition</u>  <u>BS increases this value by one from 1.</u> <u>If there are 7 partitions, 3 for modified information and 4 for unmodified information, partition counts are 1,2,0,1,2,3,0</u>
TLV encoded information for the overall channel	Var	TLV specific
Begin PHY Specific Section {		See applicable PHY section
For(i=1; i<=n;i++) {		For each downlink burst profile 1 to n
Downlink Burst Profile		PHY specific
}		
}		
}		

[Modify the Table 17 in section 6.3.2.3.3]

syntax	size	Notes
UCD Message Format() {		
Management Message Type = 0	8 bits	
Configuration Change Count	8 bits	

<u>TLV Partitioning Status Index</u>	4 bits	0: No partition 1: message with the partition containing some modified information. Unmodified information can follow. 2: message with only unmodified information
<u>TLV Partitioning Count</u>	4 bits	0: last partition 1: first partition  BS increases this value by one from 1. If there are 7 partitions, 3 for modified information and 4 for unmodified information, partition counts are 1,2,0,1,2,3,0
Raging Backoff Start	8 bits	
Ranging Backoff End	8 bits	
Request Backoff Start	8 bits	
Request Backoff End	8 bits	
TLV encoded information for the overall channel	Var	TLV specific
Begin PHY Specific Section {		See applicable PHY section
For(i=1; i<=n; i++) {		For each uplink burst profile 1 to n
Uplink Burst Profile		PHY specific
}		
}		
}		

TLV Partitioning Status Index

This field indicates the Partitioning status of current TLV information in DCD/UCD.

TLV Partitioning Count

This field is increased by one for each partition. It is set to 0 for the last partition

**References:**

[1] IEEE P802.16-REVd/D5-2004 Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems