Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
	Efficient transmission of DCD and UCD message
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Re:	
Abstract	Clarifications for H-ARQ region
Purpose	Adopting of proposed method into P802.16e
Notice	
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Efficient transmission of DCD and UCD message

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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 text change

[Remedy1]

[Remedy1a: 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	
TLV Partitioning Status Index	4 bits	0: No partition 1: message with the partition containing some modified information. Unmodified information can follow. 2: message with only unmodified information
TLV Partitioning Count	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
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
}		
}		
}		

[Remedy 1b : Modify the table 17 in section 6.3.2.3.3]

Syntax	size	Notes
UCD_Message_Format() {		
Management Message Type =	8 bits	

0		
Configuration Change Count	8 bits	
TLV Partitioning Status Index	4 bits	0: No partition 1: message with the parttion containing some modified information. Unmodified information can follow. 2: message with only unmodified information
TLV Partitioining Count	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

[Remedy 2 : Modify line 59 at page 43, section 6.3.2.3 as following:]

MAC Management messages on the Basic~~, Broadcast~~, and Initial Ranging connections shall neither be fragmented nor packed.

Pros. : Very Simple.

Cons. : Until every fragmentations are received, MSS cannot decode it.

There are not many message transmitted with Broadcast CID in TGd

- DL-MAP/UL-MAP : no need to be fragmented. It should be transmitted in a frame without fragmentation.

- UCD/DCD : Need for correction. Very big size as marked in the contribution.

- FPC : Already be able to partition to fit in a frame

- Mesh related message : I don't know.

Remedy3

[Remedy3a: Modify the table 15 in section 6.3.2.3.1 as following]

Syntax	Size	Notes
DCD_Message_Format() {		
Management Message Type = 1	8 bits	
Downlink channel ID	8 bits	
Configuration Change Count	8 bits	
Total number of partitioning	4 bits	
Partitioning Count	4 bits	Start from 0 to total number of partitioning -1
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
}		
}		
}		

[Remedy 1b : 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	
Total number of partitionnig	4 bits	
Partitioning Count	4 bits	Start from 0 to total number of partitioning -1
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
}		
}		
}		