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Title	Enhanced Remedy for relaying DCD and UCD messages in the in-band non-transparent scenario	
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Source(s)	Kanchei (Ken) Loa, Hua-Chiang Yin, Heng-Iang Hsu, Yi-Hsueh Tsai, Shiann Tsong Sheu, Yung-Ting Lee, Youn-Tai Lee, Frank C.D. Tsai, Chih-Chiang Hsieh, Tien-Hsiang Lo	Voice: +886-2-27399616 Fax: +886-2-23782328 loa@nmi.iii.org.tw
	Institute for Information Industry 8F, No. 218, Sec. 2, Dunhua S. Rd., Taipei City 106, Taiwan, ROC.	
Re:	IEEE 802.16j-07/013: "Call for Technical Comments Regarding IEEE Project 802.16j"	
Abstract	This contribution proposes the enhanced remedy of relaying DCD and UCD messages in the in-band non-transparent scenario.	
Purpose	Text proposal for 802.16j Baseline Document.	
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## Enhanced Remedy for relaying DCD and UCD messages in the In-band Non-transparent Scenario

Kanchei (Ken) Loa, Hua-Chiang Yin, Heng-Iang Hsu, Yi-Hsueh Tsai, Shiann Tsong Sheu, Yung-Ting Lee, Youn-Tai Lee, Frank C.D. Tsai, Chih-Chiang Hsieh, Tien-Hsiang Lo  
**Institute for Information Industry (III)**

### 1 Introduction

In in-band non-transparent MR networks with centralized control, the MR-BS shall transfer the designated DCD and UCD messages to the corresponding RS. If this transferring mechanism is used only via a specific unicast transmission, the system performance would be down significantly due to that the total transmission time will be increased when the amount of RSs has raised. Here, we propose a simple and workable solution to reduce the pointed total transmission time.

### 2 Proposed Remedy

Our simple enhanced remedy is that the MR-BS treats the DCD and UCD messages as general data and uses different CIDs to be the differentiation tags for transferring the messages. There exist a lot of common parameters for setting each RS's DCD and UCD messages in the same MR-BS service cell. While the DCD and UCD messages must be notified from MR-BS, the control of describing DCD and UCD messages is belong to MR-BS, and the MR-BS can sort out the common parameters in these messages and then arrange each RS into the appropriate group via a multicast management CID. The proposed remedy process is to send the common parameters first via a multicast transmission, and then send the specific parameters to the corresponding RS via a unicast transmission to finish the description of the DCD and the UCD messages.

When the RS receives and decodes one of these messages sent with a multicast management CID, denoted as DCD/UCD Common Part, it shall wait for the corresponding message with its primary management CID, denoted as DCD/UCD Specific Part. After receiving and decoding both of the common and the specific information, the RS can combine the common part with specific part to reconstruct the message via the same Configuration Change Count (CCC), and then using Fragmentable Broadcast CID in the message header to broadcast the message in the designated DL access zone.

Figure 1 shows each original DCD/UCD message for the corresponding RS. In this example, the MR-BS can separate these 3 original messages into Common Part and particular Specific Part, and these two parts shall use the same DCD/UCD CCC. The MR-BS sends the Common Part with multicast management CID first, and then sends each Specific Part for the designated RS with the RS primary management CID. Each original Specific Part, which includes part of the TLV & PHY Specific Section of the associated DCD/UCD, shall be encapsulated like a general DCD/UCD. Thus the original Specific Part shall be packed with Management Message Type (8 bits), Reserved (8 bits), and Configuration Change Count (8 bits), and then be send with the corresponding RS primary management CID as shown in Figure 2. When a RS receives the Common Part, it shall buffer the Common Part and wait the associated Specific Part via the same CCC. After receiving these two parts, the RS reconstructs the original DCD/UCD message and then broadcast the message with Fragmentable

Broadcast CID. When and where to send the message is assigned by scheduler and is out of the scope of this contribution.

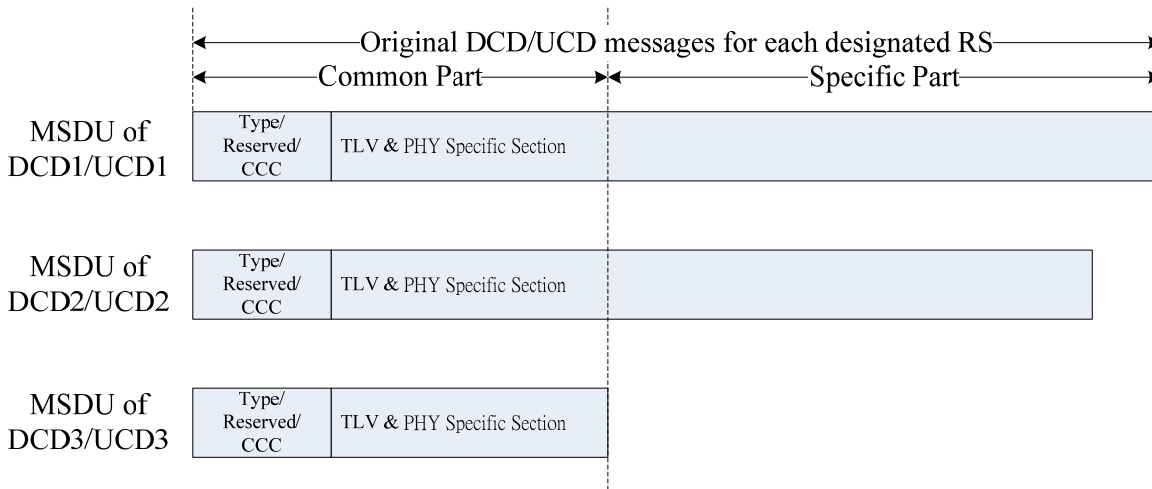


Figure 1 Example of 3 DCD/UCD messages for each RS which could be separated into Common Part and Specific Part

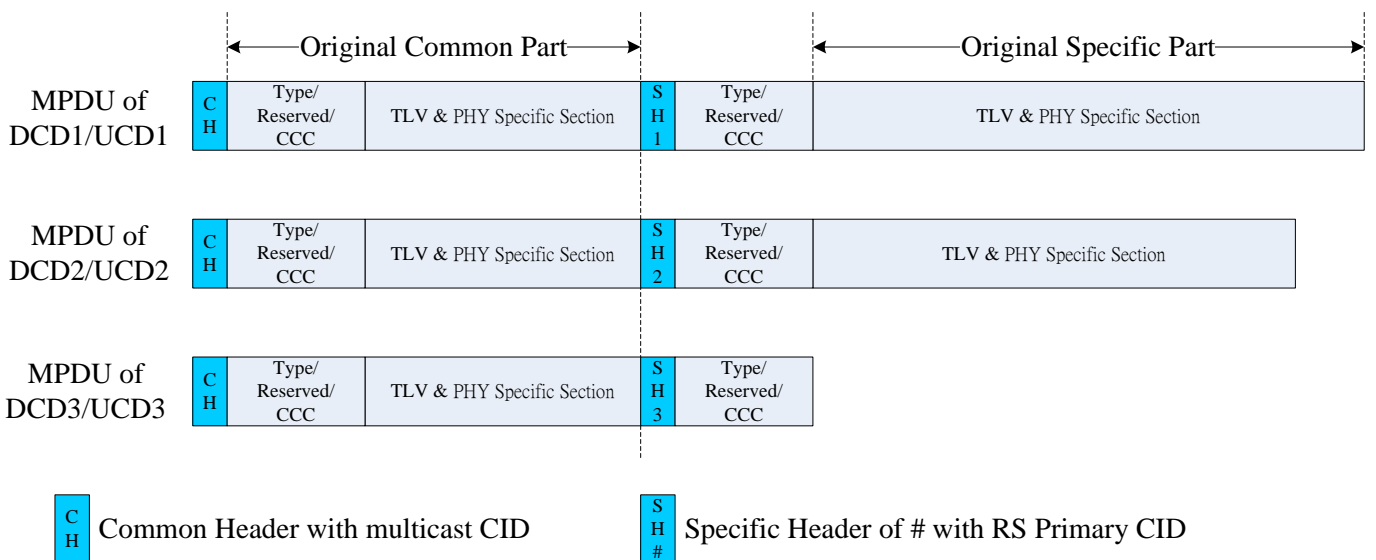


Figure 2 Example of 3 separated DCD/UCD messages for each RS

The enhanced remedy is optional function for operators and its CID translation method is defined in Table I as follows.

Table I  
The enhanced remedy of relying DCD and UCD messages via transferring CID

Connection ID used by MR-BS/RS on relay link	Connection ID used by access RS on access link	Notes

DCD for the designated access link	Multicast management CID		DCD Common Part; MR-BS multicasts the common DCD to the corresponding RS which shall wait the DCD specific part.
DCD for the designated access link	RS Primary management CID	Fragmentable Broadcast CID	DCD Specific Part; MR-BS unicasts each specific DCD to the corresponding RS which shall complete the DCD with the corresponding common part if the RS has ever received it.
UCD for the designated access link	Multicast management CID		UCD Common Part; MR-BS multicasts the common UCD to the corresponding RS which shall wait the UCD specific part.
UCD for the designated access link	RS Primary management CID	Fragmentable Broadcast CID	UCD Specific Part; MR-BS unicasts each specific UCD to the corresponding RS which shall complete the UCD with the corresponding common part if the RS has ever received it

### 3 Spec Changes

This section contains the suggested text for the 802.16 specification changes.

#### 6.3.2.3 MAC management messages

*Change Table 14 as indicated:*

Type	Message name	Message description	Connection
0	UCD	Uplink Channel Descriptor	Fragmentable Broadcast <a href="#">or</a> <a href="#">RS Primary management CID or</a> <a href="#">Multicast management CID</a>
1	DCD	Downlink Channel Descriptor	Fragmentable Broadcast <a href="#">or</a> <a href="#">RS Primary management CID or</a> <a href="#">Multicast management CID</a>

#### 6.3.2.3.7 Registration request (REG-REQ) message

*Insert following text at the end of 6.3.2.3.7:*

[When an RS enters the network, the REG-REQ may contain the following TLVs:  
\*\*Multicast management support\(11.7.28\)\*\*](#)

#### 6.3.2.3.8 Registration Response (REG-RSP) message

*Insert following text at the end of 6.3.2.3.8:*

[In response to REG-REQ from an RS, the REG-RSP may contain the following TLVs:  
\*\*Multicast management support\(11.7.28\)\*\*](#)

*Insert the following text:*

### [6.3.28 Messages and Data relaying](#)

#### [6.3.28.1 RS broadcast messages relaying](#)

##### [6.3.28.1.1 .Fragmentable broadcast messages relaying](#)

In MR networks, each RS would be assigned the different DCD/UCD message with the same configuration change count. In this case, each DCD/UCD message may be separated into the common part and the specific part before fragmentation. The common part shall be packed with multicast management CID, and the receiving RS shall buffer the common part until receiving the specific part which shall be packed as a new DCD/UCD message with the RS primary management CID. In the specific part, the message type field, reserved field and configuration change count field shall be the same as the associated common part. The receiving RS shall restructure the common part and the associated specific part to a complete DCD/UCD message, and then broadcast the message with Fragmentable Broadcast CID.

## 10.4 Well-known addresses and identifiers

*Change the Table 345 as indicated:*

Table 345—CIDs

CID	Value	Description
.....		
<a href="#">Multicast management CID</a>	<a href="#">0xFE A0 - 0xFE BF</a>	<a href="#">For the downlink multicast management services</a>
<a href="#">Multicast CIDs</a>	<a href="#">0xFE A0 C0 - 0xFE FE</a>	<a href="#">For the downlink multicast service, the same value is assigned to all MSs on the same channel that participate in this connection.</a>
.....		

*Insert new subclause 11.7.28:*

### [11.7.28 Multicast management support](#)

Name	Length	Value	Scope
<a href="#">Multicast management support</a>	<a href="#">1 byte</a>	<a href="#">Bit #0: If this bit is set to 1, RS can support the broadcast messages relaying via common/ specific mechanism (see <a href="#">6.3.28.1.1</a>) #1-7: Reserved</a>	<a href="#">REG-REQ, REG-RSP</a>