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Title	Remedy for relaying DCD, UCD, DL-MAP and UL-MAP messages in the in-band non-transparent scenario
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Re:	IEEE 802.16j-07/007r2: “Call for Technical Comments and Contributions regarding IEEE Project 802.16j”
Abstract	This contribution proposes the remedy of relaying DCD, UCD, DL-MAP and UL-MAP messages in the in-band non-transparent scenario.
Purpose	Text proposal for 802.16j Baseline Document.
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Remedy for relaying DCD, UCD, DL-MAP and UL-MAP messages in the In-band Non-transparent Scenario

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1 Introduction

In MR networks, the RS shall not only relay the traffic, but also be capable of serving each subordinate station. Although the in-band non-transparent relay frame structure has been proposed as shown in the baseline document (80216j-06_026r2.pdf), there is still no solution of relaying DCD, UCD, DL-MAP and UL-MAP messages for access links. How to relay these messages shall be defined in the standard.

This contribution proposes the remedy of relaying DCD, UCD, DL-MAP and UL-MAP messages for access links. As shown in the baseline document, a non-transparent RS shall broadcast DCD, UCD, DL-MAP and UL-MAP messages in the DL access zone. In the centralized control and centralized scheduling scenario, the above messages shall be generated by the MR-BS. While in the centralized control and distributed scheduling UL-MAP and DL-MAP messages shall be generate by the RS, and DCD and UCD messages may be generated by the RS. Here, we propose a solution to succeed in this task.

2 Proposed Remedy

We aim at the scenario of in-band non-transparent situation with centralized control mechanism. The relay functionality may introduce two types of scheduling. One is centralized scheduling where MR-BS controls all the scheduling and MAP allocation. The other is distributed scheduling, where scheduling and MAP allocation is distributed on relays also. This contribution proposes text for both type of scheduling.

2.1 Centralized Scheduling

The MR-BS shall notify the designated RS of its supporting and scheduled DCD, UCD, DL-MAP and UL-MAP messages in the DL relay zone. Our simple remedy is that the MR-BS treats the above messages as general data and uses different CIDs to be the differentiation tags for transferring the messages. When the RS receives and decodes these messages, it can aware that these messages shall be broadcasted. The only one thing that the RS shall do is to replace the CID in the message header and then broadcast the message in the DL access zone of the next frame. Because DCD and UCD messages can be fragmented, the MR-BS uses the RS primary CID to be the tag. For DL-MAP and UL-MAP messages, the MR-BS uses the RS basic CID since the messages can not be fragmented. The remedy of relying DCD, UCD, DL-MAP and UL-MAP messages via

transferring CID is defined in Table I as follows.

Table I
The remedy of relying DCD, UCD, DL-MAP and UL-MAP 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	RS Primary CID	Fragmentable broadcast CID	MR-BS unicasts each DCD to the corresponding RS
UCD for the designated access link	RS Primary CID	Fragmentable broadcast CID	MR-BS unicasts each DCD to the corresponding RS
DL-MAP for the designated access link	RS Basic CID	Broadcast CID	
UL-MAP for the designated access link	RS Basic CID	Broadcast CID	

2.2 Distributed Scheduling

In distributed scheduling, the RS can schedule DL-MAP and UL-MAP messages by itself, but DCD and UCD messages may be notified from MR-BS. Hence, the remedy of relaying DCD and UCD messages shall be followed the Table I if DCD and UCD messages should be notified from MR-BS.

3 Spec Changes

This section contains the suggested text for the 802.16 specification changes.
Change Table 14 as indicated:

Type	**Message name**	**Message description**	**Connection**
0	UCD	Uplink Channel Descriptor	Fragmentable Broadcast or RS Primary CID
1	DCD	Downlink Channel Descriptor	Fragmentable Broadcast or RS Primary CID
2	DL-MAP	Downlink Access Definition	Broadcast or RS Basic CID
3	UL-MAP	Uplink Access Definition	Broadcast or RS Basic CID

Insert the following text:
6.3.28 Messages and Data relaying

6.3.28.1 RS broadcast messages relaying

A non-transparent RS shall broadcast DCD, UCD, DL-MAP and UL-MAP messages in the DL access zone, which may be generated by the MR-BS and be sent in the relay zone. The MR-BS should send DCD and UCD messages with RS primary CID, and DL-MAP and UL-MAP messages with RS basic CID to the RS.

Upon receiving the DCD/UCD message with RS primary CID, the RS shall broadcast the DCD/UCD message with fragmentable broadcast CID.

Upon receiving the DL-MAP/UL-MAP message with RS basic CID, the RS shall broadcast the DL-MAP/UL-MAP message with broadcast CID.