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Title	<b>Dynamically relay zone configuration for two-hop relay</b>	
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Re:	IEEE 802.16-08/028: "IEEE 802.16 Working Group Letter Ballot Recirc #28d: Announcement"	
Abstract	Dynamically relay zone configuration	
Purpose	Text proposal for 802.16j Draft Document.	
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## Dynamically relay zone configuration for two-hop relay

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### Introduction

In current 16j/D5 standard, for the MR system using non-transparent RSs, the start point of the first DL relay zone is described by the R-Zone\_Location in the previous R-FCH, thus the MR-BS can dynamically configure the downlink relay zone for 2-hop relay. However, the uplink relay zone can only be configured by the RCD message, which incurs high overhead when the configuration of uplink relay zone is changed frequently. (see Figure 1)

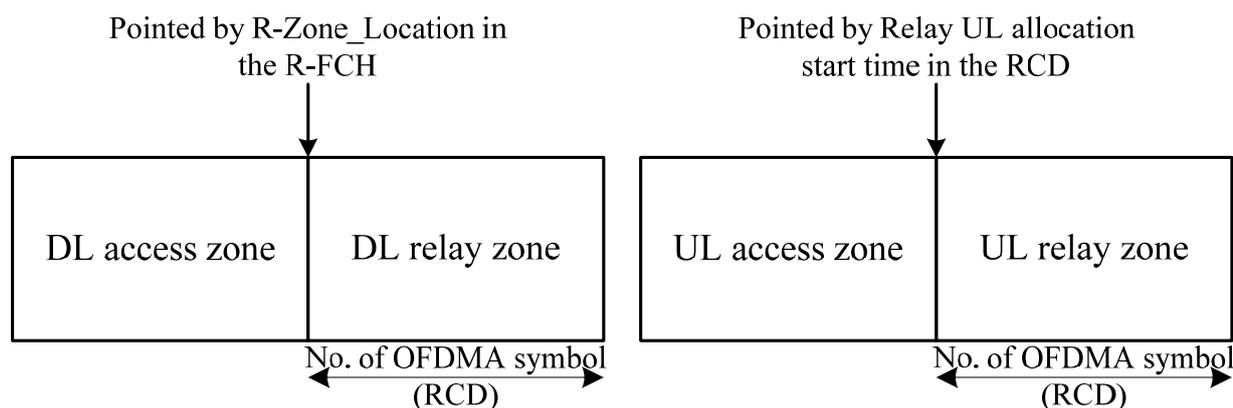


Figure 1 Relay zone configured by RCD

In order to support efficient dynamically relay zone configuration for the 2-hop non-transparent RS operated in distributed scheduling, we propose adding a new R-link specific IE, namely UL relay zone configuration IE, containing the four parameters to describe the UL relay zone for R-MAP.

In addition, any UL allocation in R-MAP is relative to UL Allocation Start time for RS, which can be greater than or equal to zero. Meanwhile, any UL allocation in the access zone refers to next frame. So, when RS sends its UL access zone's scheduling info to its MS at frame-k, it refers to frame k+1, e.g., frame k+1 already scheduled. So, any dynamic update on frame configuration should refer to at least 2 frames later than the reception time of R-MAP if an IE in the R-MAP will be used to update configuration. Assume UL Allocation start time for RS is 0 or 1. In these cases, RS will not be able to update its UL access zone scheduling. Even if UL Allocation start time for RS is 2, it will have a very short time to update/re-compute its UL scheduling, e.g., the interval between R-MAP (it receives) and the following UL MAP (it will transmit) can be as low as 2 ms.

Therefore, a separate timer “UL relay zone configuration action frame” for this specific IE is proposed.

In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the draft standard P802.16j/D5 are listed below.

## Spec changes

[Modify the following text in line 24 of page 229 as indicated:]

### 8.4.5.10.1 R-link specific IE

Table 496c—R-link specific IE types

Type (hexadecimal)	Usage
0C	<u>UL relay zone configuration</u>
0E0D-1F	Reserved

#### 8.4.5.10.1.11 UL relay zone configuration IE format

Syntax	Size	Notes
<u>UL relay zone configuration IE Format() {</u>	-	-
<u>Type</u>	<u>5 bits</u>	<u>Relay zone configuration IE = 0x0C</u>
<u>Length</u>	<u>4 bits</u>	<u>Length = 6</u>
<u>OFDMA symbol offset</u>	<u>8 bits</u>	<u>This value indicates start symbol offset of all subsequent UL allocations in this R-MAP message. The reference point of this offset is the start of UL sub-frame.</u>
<u>Subchannel offset</u>	<u>8 bits</u>	<u>This value indicates start subchannel offset of all subsequent UL data burst allocations in this message (R-MAP).</u>
<u>No. of OFDMA symbol</u>	<u>8 bits</u>	
<u>No. of subchannel</u>	<u>8 bits</u>	
<u>}</u>	-	-

### 11.24.1 Generic channel description

Name	Type	Length	Value	Scope
Relay UL allocation start time for operational RS	7		Indicates the effective start time of the uplink allocation defined by the R-MAP on R-link	RCD
<u>UL relay zone configuration action frame</u>	<u>8</u>	<u>1</u>	<u>Indicates the effective action frame of the UL relay zone configuration by the R-MAP on R-link</u>	<u>RCD</u>

#### Relay UL allocation start time

UL allocation start time indicates the effective start time of the uplink allocation defined by the R-MAP on R-link. If the effective start time is defined as 0, the uplink allocation defined by the R-MAP is effective in the current frame; if the value is set to N, the uplink allocation defined by the R-MAP in frame i is effective in frame i + N.

#### UL relay zone configuration action frame

UL relay zone configuration action frame indicates the effective action time of the UL relay zone configuration defined by the R-MAP on R-link. If the effective action time is defined as 0, the UL relay configuration defined by the R-MAP is effective in the current frame; if the value is set to N, the configuration defined by the R-MAP in frame i is effective in frame i + N.