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Re:	IEEE 802.16j-07/013: “Call for Technical Comments Regarding IEEE Project 802.16j”
Abstract	This contribution proposes procedures for MS CDMA BR Ranging in Transparent RS system
Purpose	Text proposal for 802.16j Baseline Document
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MS CDMA BR Ranging in Transparent RS Systems

Introduction

In an MR system under centralized control, there are three stages to complete the MS CDMA BW request (BR) via RS as follows,

1. Upon receiving a CDMA BR ranging code from an MS, the access RS transmits the associated information to the MR-BS through the UL relay path.
   - The contention-based scheme defined in 6.3.6.7.2.1 and 6.3.6.8 or the dedicated scheme defined in 6.3.6.7.3 of the baseline document IEEE 802.16j-06/026r3 can be used for the access RS to transmit the information of the received CDMA BR ranging code.
2. Based on the received information of CDMA BR ranging code and UL relay path, the MR-BS allocates BW for the MS to send the BR header and the RSs along the UL relay path to relay the BR header.
   - The continuous BW allocation scheme defined in 6.3.6.7.2.2 or the dedicated BW allocation scheme defined in 6.3.6.7.3 can be used for the MR-BS to provide the BW allocation to the MS and the RSs along the UL relay path.
3. The RSs along the UL relay path relays the BR header sent from the MS to the MR-BS such that the MR-BS can make decision on the BW allocation.
   - As described in 6.3.6.7.2.1, the BR header received from MS is relayed to the MR-BS without any modification by the RSs along the UL relay path.

However, in an MR system with transparent RSs, the CDMA BR ranging code sent by MS might be received by the MR-BS and multiple RSs near the MS as shown in Figure 1. In order to decide the most appropriate path to communicate with the MS, every transparent RS must report the information of the received CDMA BR ranging code to the MR-BS in stage 1, as long as the CDMA BR ranging code can be decoded successfully. But, the schemes defined for stage 1 in the baseline document, which is applicable to non-transparent RS, cannot be used by the transparent RS since the MR_Code-REP message does not contain sufficient information for MR-BS making decision. In order to resolve the problem with minimum modifications on the baseline document, we propose a CDMA-based bandwidth request scheme for transparent RS that utilizes the RNG-REQ message instead of the MR_Code-REP message.

When transparent RS is used to relay the BR header, the MR-BS is required to be able to identify the access RS such that the MR-BS can allocate the corresponding UL BWs for all RSs along the UL relay path. The RS identity is required because the path for relaying BR header might be different from the designated UL relay path for the MS. Therefore, extra information of transparent RS ID is needed in the relayed BR for the MR-BS to allocate appropriate UL BW. One way to piggyback the information of transparent access RS ID is to assign a dedicated UL burst for every RS along the UL relay path to relay the BR header to its superordinated station. However, this scheme suffers when there are more than one UL bursts for RS simultaneously and the MR-BS

cannot handle multiple BR headers at one time. Therefore, we propose a BR_Relaying message in this document.

In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r3 are listed below.

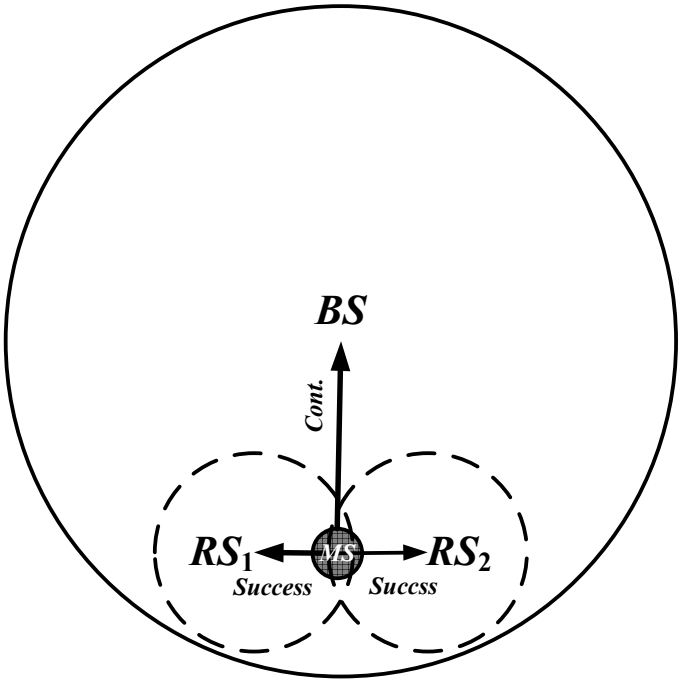

Figure 1 Examples of MR-BS and multiple RSs receiving MS ranging code in transparent RS system

Text Proposal

[Insert the following new subclause 6.3.2.3.83 in page 46 as indicated:]

6.3.2.3.83 BR_Relaying message

Table xxx – BR_Relaying message format

Syntax	Size	Notes
BR_Relaying_Message_Format() {	-	-
Management Message Type = xx	8 bits	
Bandwidth request header	48 bits	BR header sent by MS in CDMA_allocation_IE
}	-	-

6.3.6.8 Relaying support for Bandwidth Requests

[Add the following text at the end of 6.3.6.8 as indicated:]

Upon receiving bandwidth request sent from the MS in the CDMA_allocation_IE, the RS should relay the

bandwidth request by BR_Relaying message.
