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Title	<b>MS contention-based ranging and automatic adjustments with transparent RS attached to a superordinate nontransparent RS under centralized scheduling</b>	
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Re:	IEEE 802.16j-07/043: "IEEE 802.16 Working Group Working Group Letter Ballot #28"	
Abstract	This contribution proposes MS contention-based ranging and automatic adjustments with transparent RS attached to a superordinate nontransparent RS under centralized scheduling	
Purpose	Text proposal for 802.16j Draft Document.	
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# MS contention-based ranging and automatic adjustments with transparent RS attached to a superordinate nontransparent RS under centralized scheduling

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## Introduction

In P802.16j/D1, “The RS group has a superordinate station (non-transparent RS or MR-BS) that is the superordinate station of all RSs in the group. All the RSs in the RS group shall either transmit the same preamble, FCH and MAPs or they all do not transmit any preamble, FCH or MAPs. The MR-BS or the superordinate station carries out resource control and scheduling for the RS group.”

However, a subordinate transparent RS attached to a superordinate non-transparent RS under centralized scheduling cannot handle MS contention-based ranging and automatic adjustments. If the ranging code is received by both subordinate transparent RSs and superordinate non-transparent RS, the transparent RSs must request uplink bandwidth to send MR\_Code-REP message to MR-BS, whereas the non-transparent RS must request downlink bandwidth to broadcast RSG-RSP message to MSs. As a result, the MR-BS will compare measured signal information at each transparent RS to decide the most appropriate path to communicate with the code originating MS but will also allocate downlink bandwidth for non-transparent RS broadcasting RNG-RSP message. Hence, the decision at the MR-BS will be incorrect. (see Figure 1)

Therefore, we propose a solution described as follows (see Figure 2). If the ranging code is received by both subordinate transparent RSs and superordinate non-transparent RS, the transparent RSs must request uplink bandwidth to send MR\_Code-REP message to the non-transparent RS. As a result, the non-transparent RS will compare measured signal information at each transparent RS to decide the most appropriate path to communicate with the code originating MS. Then, the non-transparent RS must request downlink bandwidth for broadcasting RNG-RSP message.

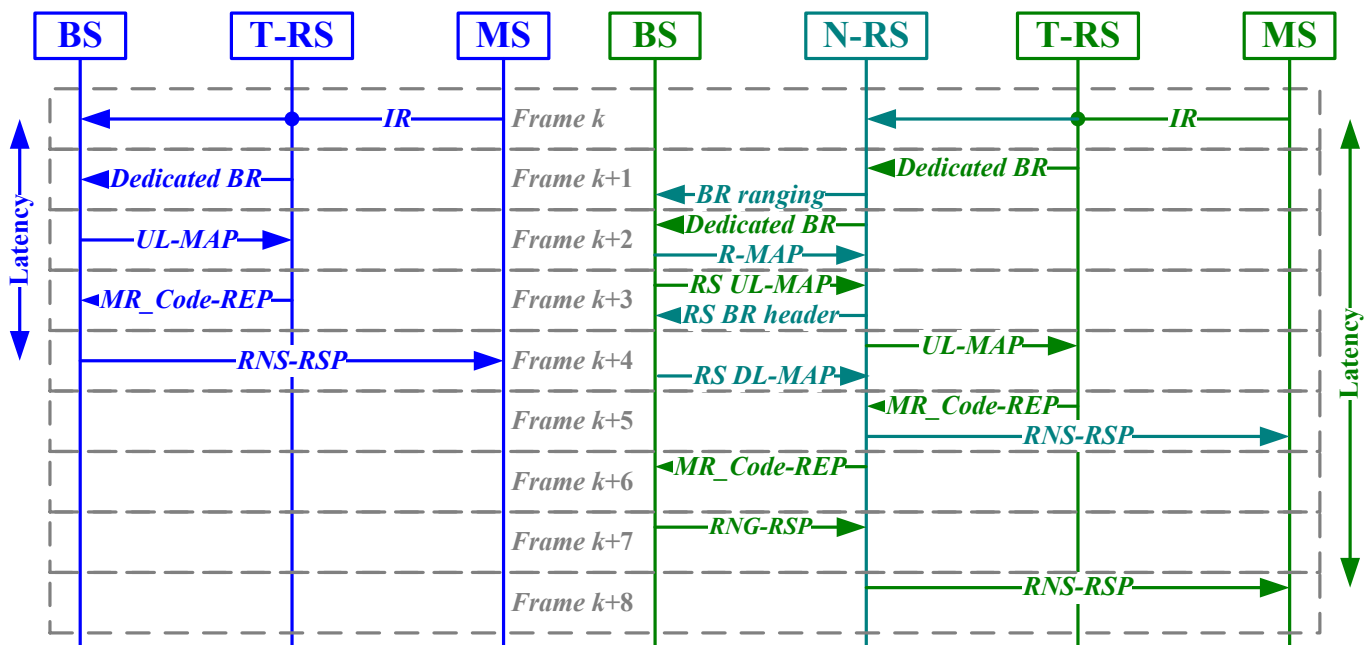


Figure 1 Current scenario

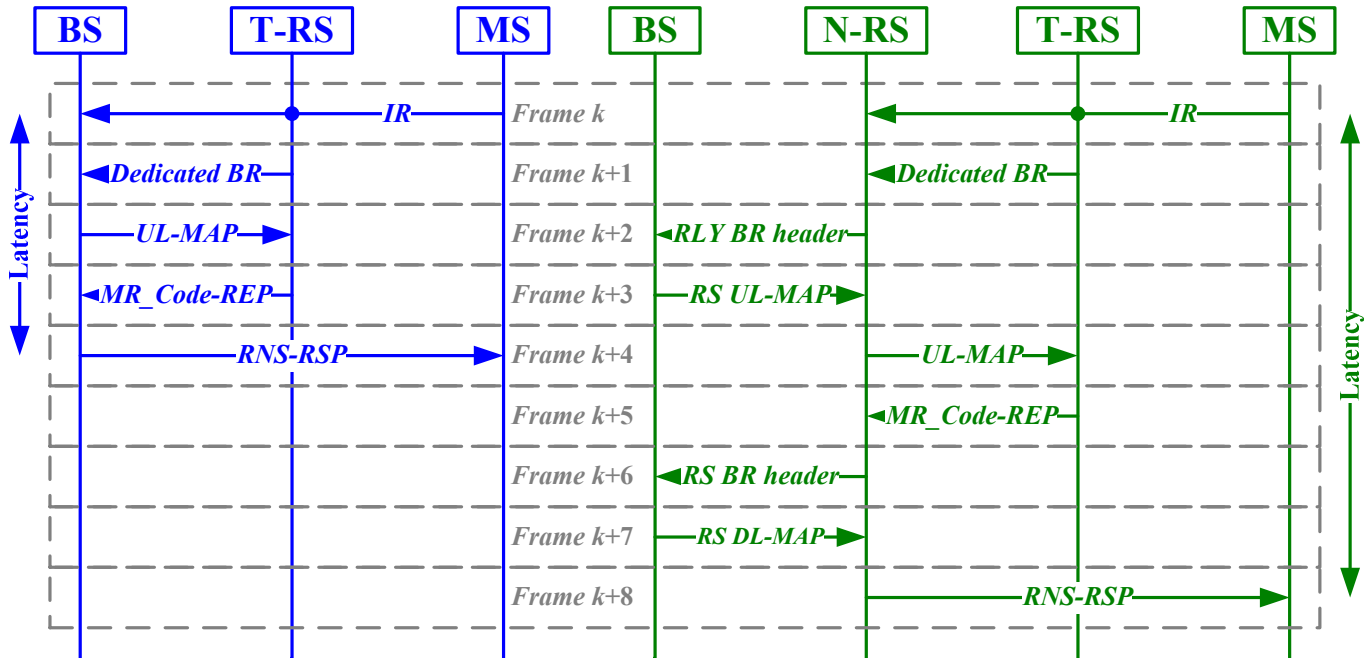


Figure 2 Proposed scenario

In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the draft standard P802.16j/D1 are listed below.

## Specification Changes

[Insert the following subclause 6.3.10.3.9 in line 16 of page 122 as indicated:]

### 6.3.10.3.9 MS contention-based ranging and automatic adjustments with transparent RS attached to a superordinate nontransparent RS under centralized scheduling

In CDMA ranging and network entry procedure, MS scans for downlink channel and establish synchronization with the non-transparent group members, obtains the transmit parameters from UCD message as described in sections 6.3.9.1 to 6.3.9.4.

The CDMA ranging code may be received by the superordinate nontransparent RS and some subordinate transparent RSs near the MS. The subordinate RSs receiving the initial ranging code with sufficient signal quality shall transmit an MR Code-REP message containing ranging code attributes and adjustment information to the parent nontransparent RS with the RS basic CID. When a subordinate RS receives multiple codes in a frame, the RS should send an MR Code-REP message containing information of multiple received ranging codes.

When the superordinate RS receives CDMA ranging code or MR Code-REP message containing CDMA ranging code with RS basic CID at the first time, it shall wait for MR Code-REQ message with the same ranging code from its subordinate RSs for T48 timer. Once T48 timer expired, the superordinate RS shall compare measured signal information at each station to decide the most appropriate path to communicate with the code originating MS, according to channel measurement information. Algorithms to select a path are out of scope of this document. Then the superordinate RS shall follow sequence described in MS contention-based ranging and automatic adjustments with non-transparent RS, where the RNG-RSP message shall contain adjustment information associated to the selected access RS, if present.

The message flow charts in Figures xxx-a, xxx-b describe the ranging and adjustment process that shall be followed by compliant RSs and MR-BSs.

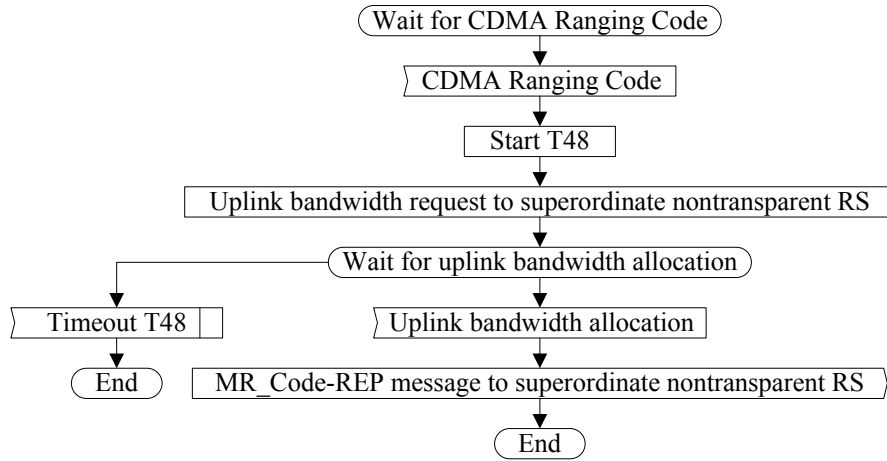


Figure xxx-a—Handling CDMA ranging code at a subordinate transparent RS

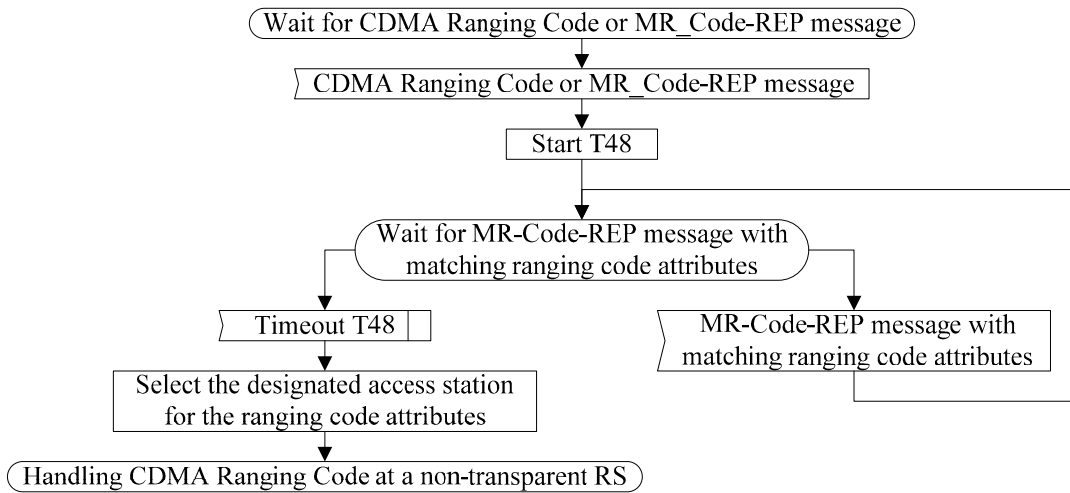


Figure xxx-b—Handling CDMA ranging code at a superordinate nontransparent RS