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Title	Unsolicited RNG-RSP with Transparent RS	
Date	2006-01-08	
Submitted		
Source(s)	<p>Kanchei (Ken) Loa, Yi-Hsueh Tsai, Chih-Chiang Hsieh, Yung-Ting Lee, Hua-Chiang Yin, Shiann-Tsong Sheu, Frank C.D. Tsai, Youn-Tai Lee, Heng-Iang Hsu Institute for Information Industry 8F., No. 218, Sec. 2, Dunhua S. Rd., Taipei City, Taiwan.</p> <p>Hang Zhang, Peiyong Zhu, Mo-Han Fong, Wen Tong, David Steer, Gamini Senarath, Derek Yu, Mark Naden, G.Q. Wang Nortel 3500 Carling Avenue Ottawa, Ontario K2H 8E9</p> <p>Yu Ge, Peng-Yong Kong, Chen-Khong Tham 21 Heng Mui Keng Terrace Singapore 119613</p> <p>[add co-authors here]</p>	<p>Voice: +886-2-2739-9616 <a href="mailto:loa@iii.org.tw">loa@iii.org.tw</a></p> <p>Voice: +1 613 7631315 <a href="mailto:WenTong@nortel.com">WenTong@nortel.com</a> <a href="mailto:pyzhu@nortel.com">pyzhu@nortel.com</a></p> <p>Voice: +65-6874.1950 Fax: +65-6775.5014 <a href="mailto:geyu@i2r.a-star.edu.sg">geyu@i2r.a-star.edu.sg</a></p>
Re:	IEEE 802.16j-06/034: "Call for Technical Proposals regarding IEEE Project P802.16j"	
Abstract	This contribution proposes procedures for unsolicited RNG-RSP with transparent RS	
Purpose	Text proposal for 802.16j Baseline Document	
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# Unsolicited RNG-RSP with Transparent RS

## Introduction

This contribution describes MS unsolicited RNG-RSP with transparent RS under centralized scheduling scheme. In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r1 are listed below.

## Text Proposal

### 6.3.10 Ranging

#### 6.3.10.3 OFDMA based ranging

##### 6.3.10.3.4 Relaying support for OFDMA based ranging

##### 6.3.10.3.4.5 Unsolicited RNG-RSP with Transparent RS

After RS received a bandwidth request CDMA ranging code, it should transmit an RLY\_RC-REP message to the serving MR-BS through the relay path with adjustment information of frequency, power, and timing corrections. The RLY\_RC-REP message is defined in xxx. When RS receives multiple codes in the ranging subchannel of a frame, the RLY\_RC-REP message sent by the RS to serving MR-BS may contain information of multiple received codes.

When the MR-BS receives bandwidth request CDMA ranging code, it shall wait for RLY\_RC-REP message from its subordinate RSs for T48 timer. Once T48 timer expired, the MR-BS could compare the measured signal information at each access station to decide the adjustment information of the code. Algorithms to decide adjustment information are out of scope of this specification. When it needs to do adjustment for the code, the MR-BS shall broadcast an RNG-RSP with associated code attribute.

When the offsets of frequency, power, and timing for any other data transmission from the MS are beyond the tolerance defined in this specification, RSs shall transmit a RLY\_RC-REP message with MS basic CID to the serving MR-BS through the relay path. The RLY\_RC-REP message is defined in xxx.

Upon receiving RLY\_RC-REP message with MS basic CID from a subordinate RS, the MR-BS may send an unsolicited RNG-RSP message with this MS basic CID to the MS.

The message sequence charts (Table xxx and Table yyy) and flow charts (Figure xxx and Figure yyy) define the unsolicited RNG-RSP process that shall be followed by compliant RSs and MR-BSs.

Table xxx – RLY-BST message format

<u>Syntax</u>	<u>Size</u>	<u>Notes</u>
<u>RLY-BST_Message_Format(){</u>		
<u>Management Message Type = xx</u>	<u>8 bits</u>	

<u>Encoded Information</u>	<u>variable</u>	<u>TBD</u>
<u>}</u>		

Table xxx – RLY\_RC-REP message format

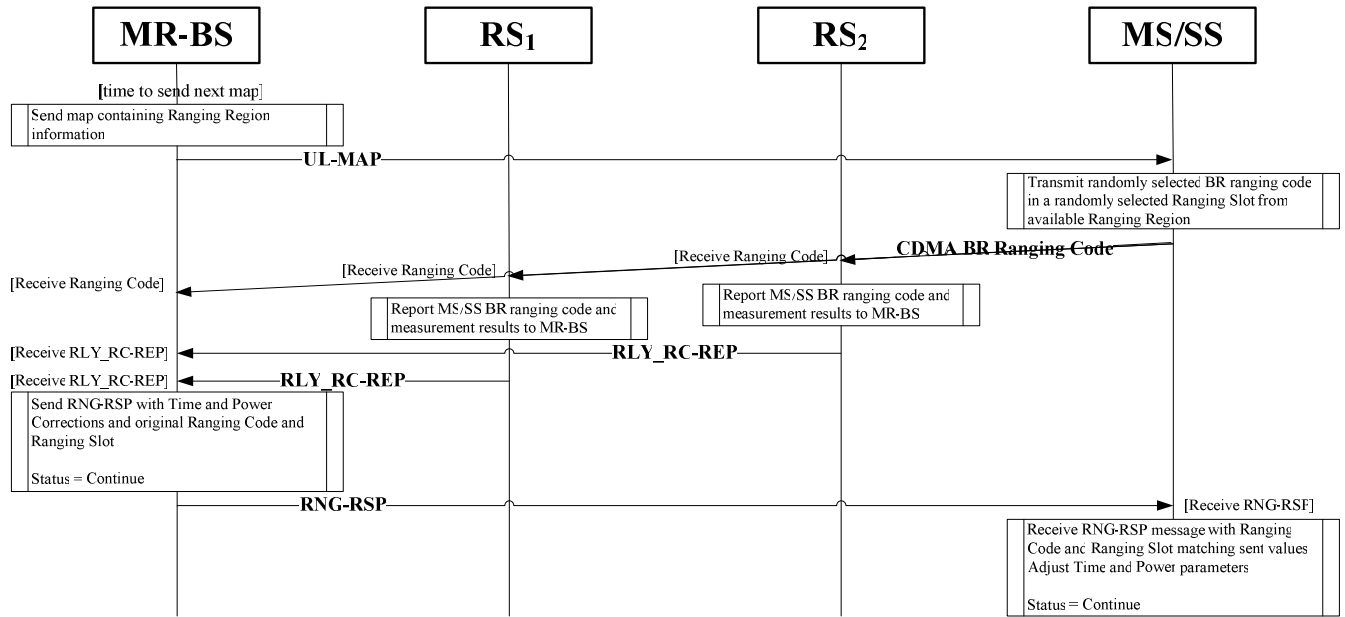
<u>Syntax</u>	<u>Size</u>	<u>Notes</u>
<u>RLY_RC-REP_Message_Format()</u>		
<u>Management Message Type = xx</u>	<u>8 bits</u>	
<u>TLV Encoded Information</u>	<u>variable</u>	<u>TLV specific</u>
<u>}</u>		

Table xxx – RLY\_RC-REP message encodings

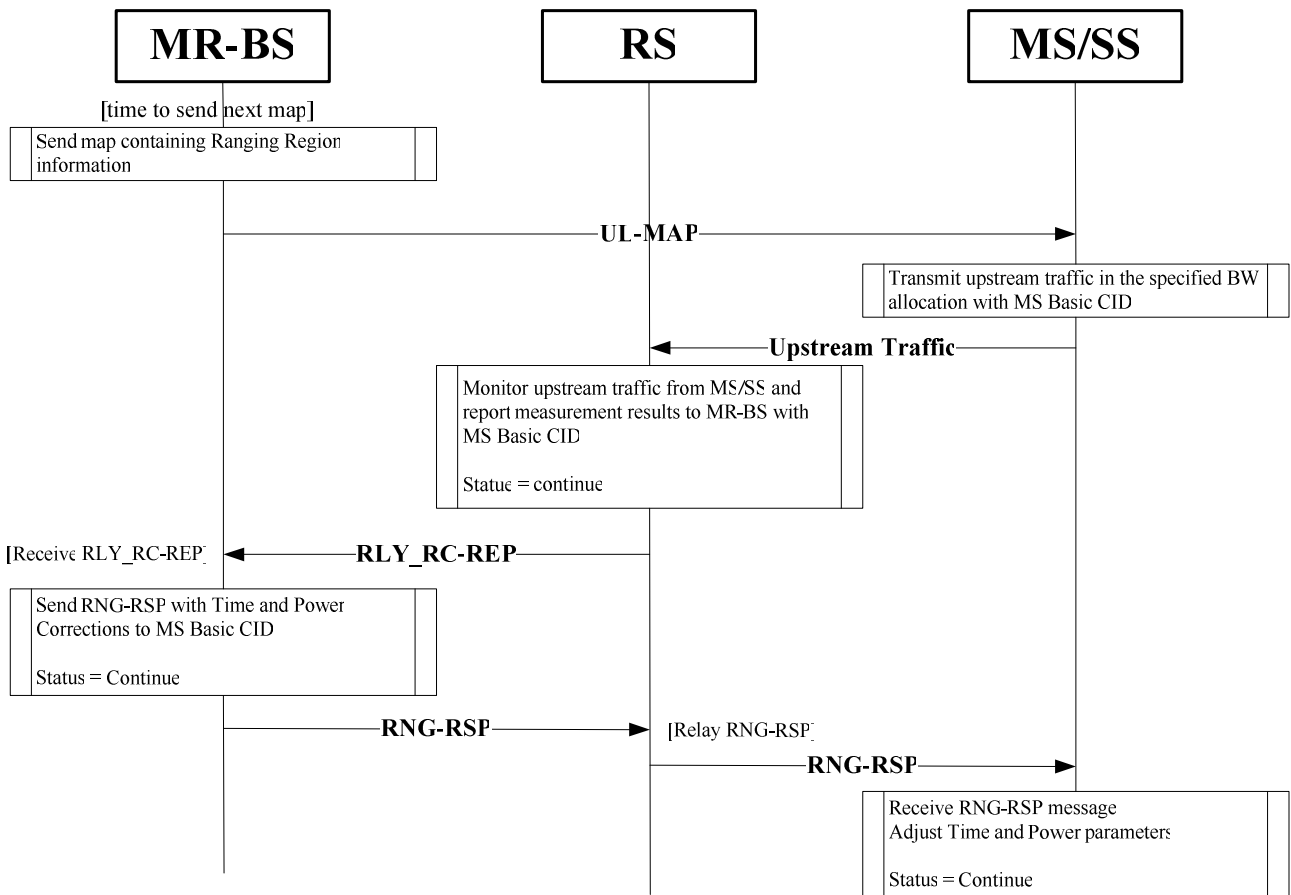
	<u>Type</u> (1 byte)	<u>Length</u>	<u>Value</u> (Variable-length)	<u>PHY</u> <u>Scope</u>
<u>Timing Adjust</u>	<u>TBA</u>	<u>4</u>	<u>Tx timing offset adjustment (signed 32-bit). The amount of time required to adjust MS transmission so the bursts will arrive at the expected time instance at the RS. Units are PHY specific (see 10.3). The SS shall advance its burst transmission time if the value is negative and delay its burst transmission if the value is positive.</u>	<u>OFDMA</u>
<u>Power Level Adjust</u>	<u>TBA</u>	<u>1</u>	<u>Tx Power offset adjustment (signed 8-bit, 0.25 dB units). Specifies the relative change in transmission power level that the MS is to make in order that transmissions arrive at the RS at the desired power. When subchannelization is employed, the subscriber shall interpret the power offset adjustment as a required change to the transmitted power density.</u>	<u>OFDMA</u>
<u>Offset Frequency Adjust</u>	<u>TBA</u>	<u>4</u>	<u>Tx frequency offset adjustment (signed 32-bit, Hz units). Specifies the relative change in transmission frequency that the MS is to make in order to better match the RS. (This is fine-frequency adjustment within a channel, not reassignment to a different channel.). The MS shall increase its transmit frequency if the value is positive and decrease its transmit frequency if the value is negative.</u>	<u>OFDMA</u>
<u>Ranging Status</u>	<u>TBA</u>	<u>1</u>	<u>Used to indicate whether uplink messages are received within acceptable limits by RS. 1 = continue, 2 = abort, 3 = success</u>	<u>OFDMA</u>
<u>Received Ranging Code Attributes</u>	<u>TBA</u>	<u>4</u>	<u>Bits 31:22 – Used to indicate the OFDM time symbol reference that was used to transmit the ranging code.</u>	<u>OFDMA</u>

			<p><u>Bits 21:16 – Used to indicate the OFDMA subchannel reference that was used to transmit the ranging code.</u></p> <p><u>Bits 15:8 – Used to indicate the ranging code index that was sent by the MS.</u></p> <p><u>Bits 7:0 – The 8 least significant bits of the frame number of the OFDMA frame where the MS sent the ranging code.</u></p>	
<u>MS CINR mean</u>	<u>TBA</u>	<u>1</u>	<p><u>The MS CINR mean parameter indicates the CINR measured by the RS from the MS. The value shall be interpreted as a signed byte with units of (TBD) dB. The measurement shall be performed on the CDMA ranging signal sent by the MS and averaged over the measurement period.</u></p>	<u>OFDMA</u>
<u>MS RSSI mean</u>	<u>TBA</u>	<u>1</u>	<p><u>The MS RSSI mean parameter indicates the Received Signal Strength measured by the RS from the MS. The value shall be interpreted as an unsigned byte with units of (TBD) dB, such that 0x00 is interpreted as (TBD) dBm, an RS shall be able to report values in the range (TBD) dBm to (TBD) dBm. The measurement shall be performed on the CDMA ranging signal sent by the MS and averaged over the measurement period</u></p>	<u>OFDMA</u>
<u>MS Basic CID</u>	<u>TBA</u>	<u>2</u>	<u>MS Basic CID</u>	<u>OFDMA</u>

**Table xxx: Unsolicited RNG-RSP procedure triggered by CDMA BR ranging code in transparent RS systems**



**Table yyy: Unsolicited RNG-RSP triggered by upstream traffic in transparent RS systems**



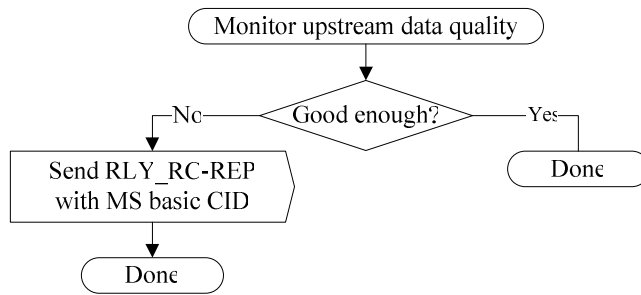


Figure xxx Unsolicited RNG-RSP – Transparent Access RS (part 1)

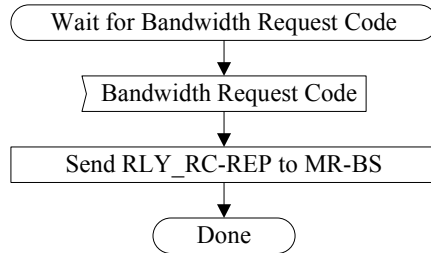


Figure xxx Unsolicited RNG-RSP – Transparent Access RS (part 2)

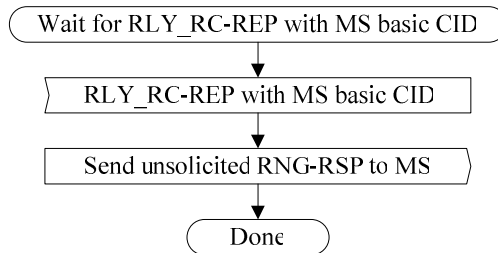


Figure yyy Unsolicited RNG-RSP with Transparent RS– MR-BS (part 1)

Note: T48 is the timer between the MR-BS sending an RNG-RSP to an MS and receiving a ranging code or RLY\_RC-REP

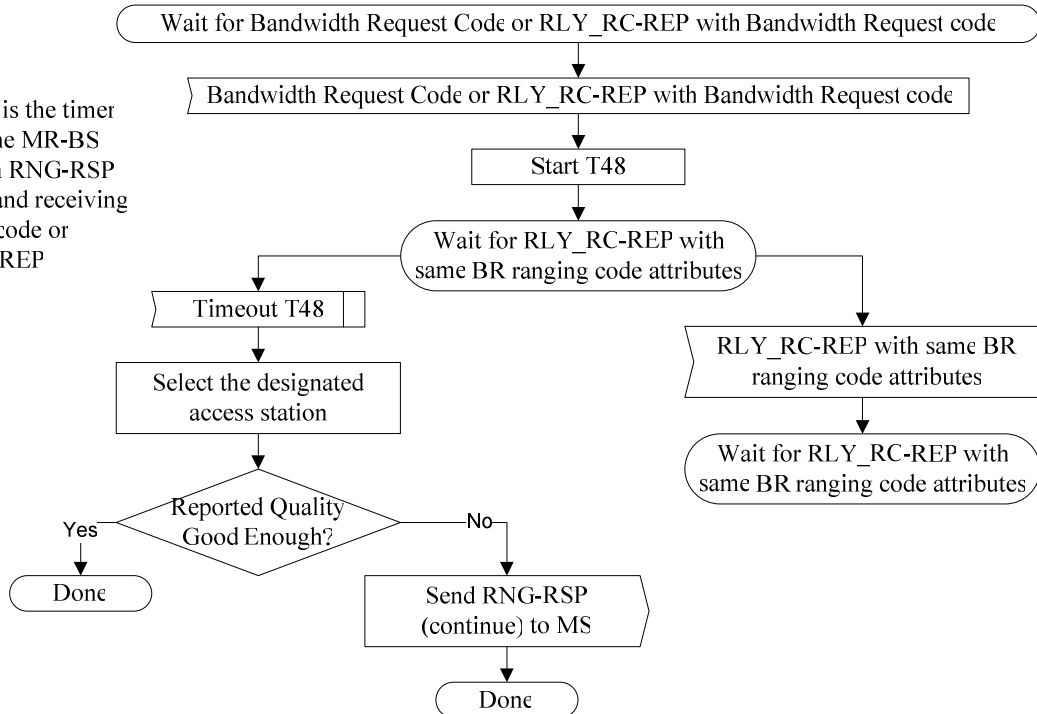


Figure yyy Unsolicited RNG-RSP with Transparent RS– MR-BS (part 2)