Project	IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>
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Re:	IEEE 802.16j-06/034: "Call for Technical Proposals regarding IEEE Project P802.16j"
Abstract	This contribution proposes procedures for MS CDMA-based BR with transparent RS
Purpose	Text proposal for 802.16j Baseline Document
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with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

MS CDMA-based BR with Transparent RS

Introduction

This contribution describes MS CDMA-based bandwidth request (BR) 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

6.3.6 Bandwidth allocation and request mechanisms

6.3.6.8 Relaying support for Contention-based CDMA Bandwidth Requests

6.3.6.8.1 Contention-based CDMA Bandwidth Requests with transparent RS

The RS should support the CDMA-based mechanism as specified in the following paragraphs of this subclause.

After RS received a bandwidth request CDMA ranging code resulting in success status, it shall transmit RLY_RC-REP message to the serving MR-BS through the relay path. The RLY_RC-REP message is defined in xxx. When RS receives multiple CDMA ranging 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 bandwidth request CDMA ranging code, it shall wait for RLY_RC-REP message from its subordinate RSs for T48 timer. If the CDMA ranging code or the RLY_RC-REP message resulting in success status, the BS shall provide (an implementation dependent) uplink allocation for the corresponding MS by transmitting a CDMA allocation IE, which specifies the transmit region and Ranging Code that were used by the MS.

The message sequence charts (Table xxx) 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

Syntax	Size	Notes
RLY-BST_Message_Format(){		
Management Message Type = xx	8 bits	
Encoded Information	variable	TBD
}		

Table xxx – RLY_RC-REP message format

Syntax	Size	Notes
RLY_RC-REP_Message_Format(){		

Management Message Type = xx	8 bits	
TLV Encoded Information	variable	TLV specific
}		

Table xxx – RLY_RC-REP message encodings

	Type (1 byte)	Length	Value (Variable-length)	PHY Scope
Timing Adjust	TBA	4	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.	OFDMA
Power Level Adjust	TBA	1	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.	OFDMA
Offset Frequency Adjust	TBA	4	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.	OFDMA
Ranging Status	TBA	1	Used to indicate whether uplink messages are received within acceptable limits by RS. 1 = continue, 2 = abort, 3 = success	OFDMA
Received Ranging Code Attributes	TBA	4	Bits 31:22 – Used to indicate the OFDM time symbol reference that was used to transmit the ranging code. Bits 21:16 – Used to indicate the OFDMA subchannel reference that was used to transmit the ranging code.	OFDMA

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			Bits 15:8 – Used to indicate the ranging code index that was sent by the MS. Bits 7:0 – The 8 least significant bits of the frame number of the OFDMA frame where the MS sent the ranging code.	
MS CINR mean	TBA	1	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.	OFDMA
MS RSSI mean	TBA	1	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	OFDMA

Table xxx – RLY_RC-ACP message format

Syntax	Size	Notes
RLY_RC-ACP_Message_Format(){		
Management Message Type = xx	8 bits	
TLV Encoded Information	variable	TLV specific
}		

Table xxx – RLY_RC-ACP message encodings

	Type (1 byte)	Length	Value (Variable-length)	PHY Scope
CDMA Allocation Info	TBA	Variable	CDMA Allocation Info indicates the RS to receive the PDU (i.e. BR message) on a specified burst.	OFDMA

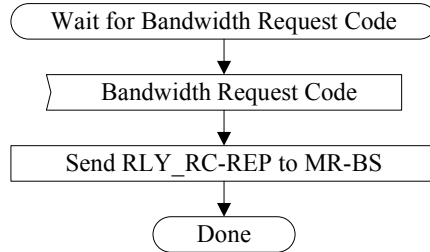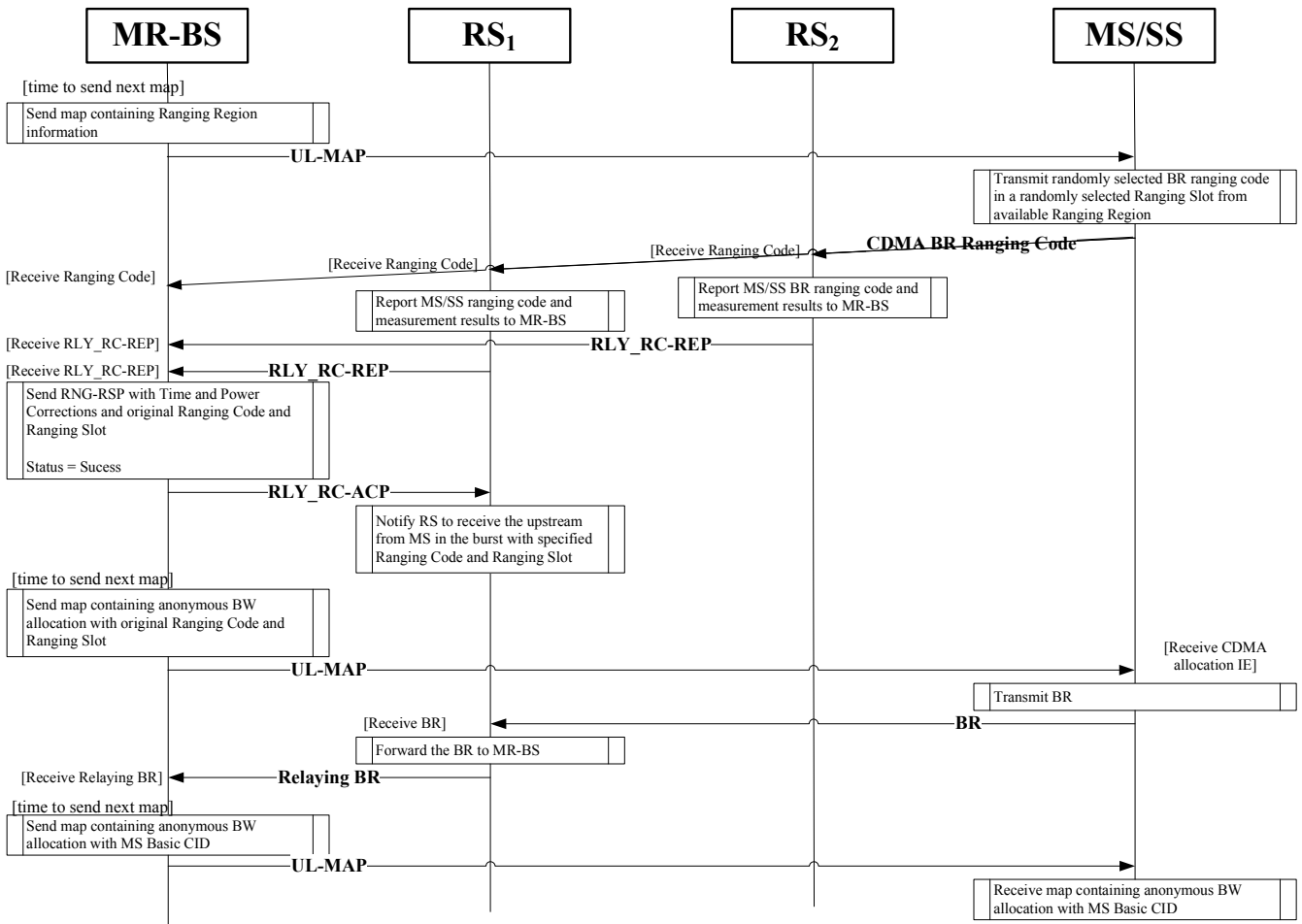Table xxx: MS CDMA Bandwidth Request procedure in transparent RS systems

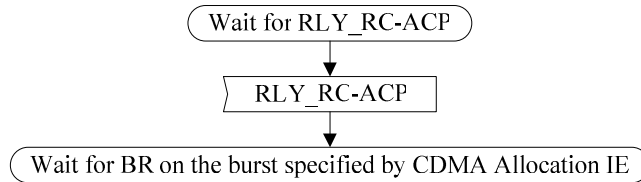Figure xxx MS CDMA Bandwidth Request – Transparent Access RS (part 1)

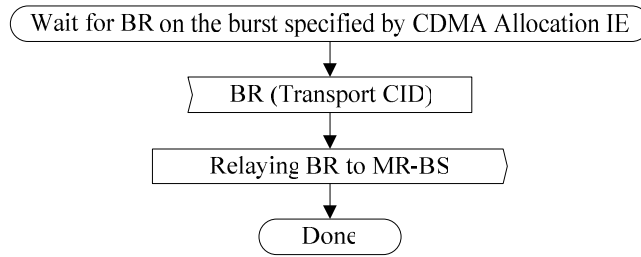Figure xxx MS CDMA Bandwidth Request – Transparent Access RS (part 2)

Wait for BR on the burst specified by CDMA Allocation IE

BR (Transport CID)

Relaying BR to MR-BS

Done

Figure xxx MS CDMA Bandwidth Request – Non-transparent Access RS (part 3)

Wait for Bandwidth Request Code or RLY_RC-REP with Bandwidth Request code

Bandwidth Request Code or RLY_RC-REP with Bandwidth Request code

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

Start T48

Wait for RLY_RC-REP with same BR ranging code attributes

Timeout T48

Select the designated access station

Reported Quality Good Enough?

No

Yes

Done

RLY_RC-ACP to RS

RLY_RC-REP with same BR ranging code attributes

Wait for RLY_RC-REP with same BR ranging code attributes
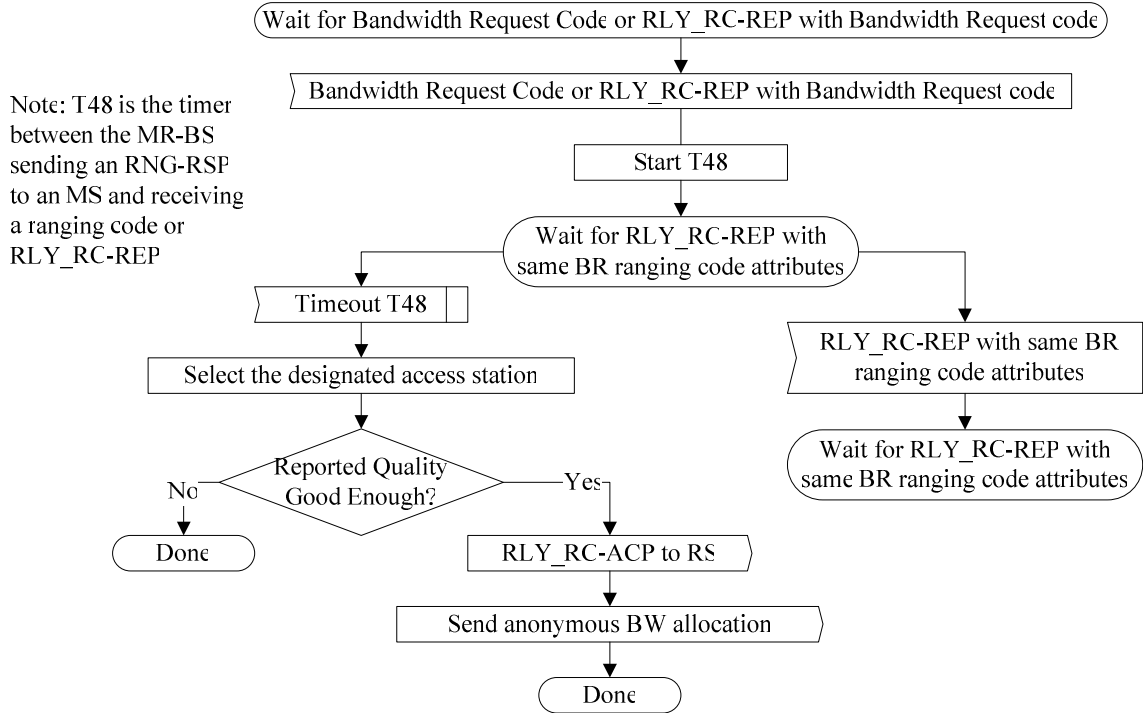
Send anonymous BW allocation

Done

Figure yyy MS CDMA Bandwidth Request with Transparent RS – MR-BS

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