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Re:	IEEE 802.16j-07/007r2: “Call for Technical Comments and Contributions regarding IEEE Project 802.16j”
Abstract	This contribution proposes procedures for MS CDMA-based BR in transparent RS system
Purpose	Text proposal for 802.16j Baseline Document
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MS CDMA-based BR in Transparent RS system

Introduction

This contribution describes MS CDMA-based bandwidth request (BR) in transparent RS system. In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r2 are listed below.

Text Proposal

6.3.2.1 MAC header formats

6.3.2.1.1 Generic MAC header

6.3.2.1.1.1 Generic MAC header for relay

Type bit Value	
#5 most significant bit (MSB)	Relaying BR subheader 1 = present, 0 = absent
#4	ARQ Feedback Payload 1 = present, 0 = absent
#3	Extended Type Indicates whether the present Packing or Fragmentation Subheaders, is Extended 1 = Extended 0 = not Extended. Applicable to connections where ARQ is not enabled
#2	Fragmentation subheader 1 = present, 0 = absent
#1	Packing subheader 1 = present, 0 = absent
#0	least significant bit (LSB) Downlink: FAST-FEEDBACK Allocation subheader Uplink: Grant Management subheader 1 = present, 0 = absent

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. The BR ranging process shall begin by sending BR-ranging CDMA codes on the UL allocation dedicated for that purpose (for more details see 6.3.10.3). The RS shall monitor ranging channel assigned by the MR-BS.

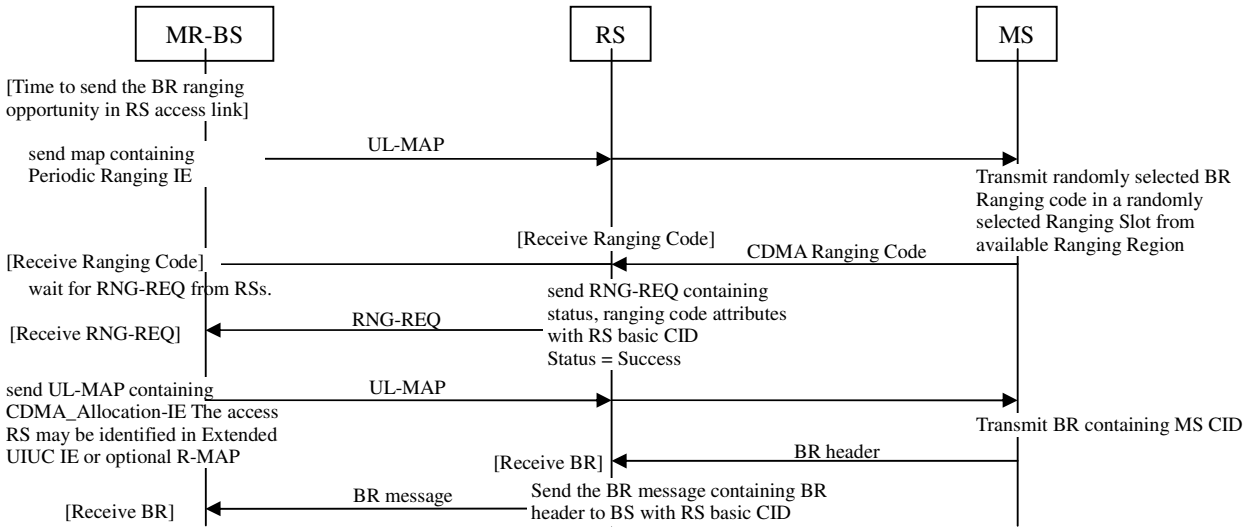
The code may be received by the MR-BS and some RSs near the MS. RSs receiving the code with sufficient signal quality shall transmit a RNG-REQ to the MR-BS with the RS basic CID. The RNG-REQ message

contains ranging status, code attributes and adjustment information such as frequency, timing and transmission power. When a RS receives multiple codes in a frame, the RS sends a RNG-REQ message which contains information of multiple codes which are received with sufficient signal quality.

When the MR-BS receives ranging code, it shall wait for RNG-REQ with the same ranging code from its subordinate RSs for T48 timer. Once T48 timer expired, the MR-BS compares 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.

If the CDMA ranging code or the RNG-REQ 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 MS shall use the allocation to transmit a Bandwidth Request MAC PDU and/or data.

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



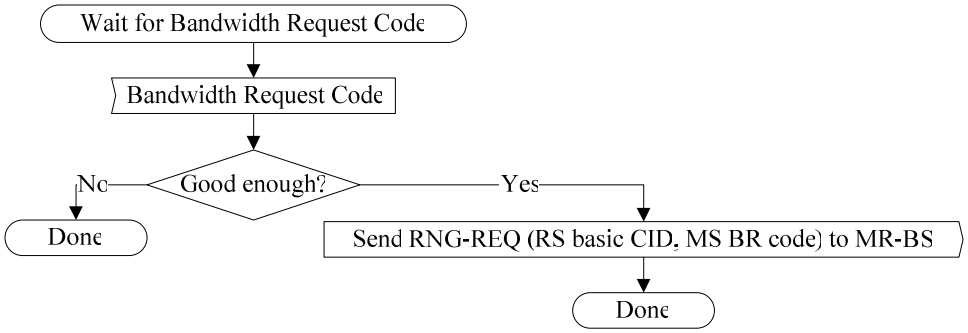


Figure xxx MS CDMA-based Bandwidth Request – Transparent Access RS (part 1)

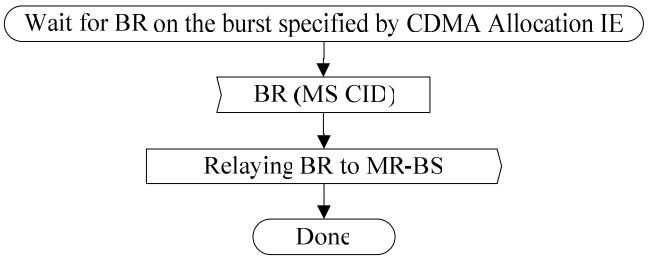


Figure xxx MS CDMA-based Bandwidth Request – Transparent Access RS (part 2)

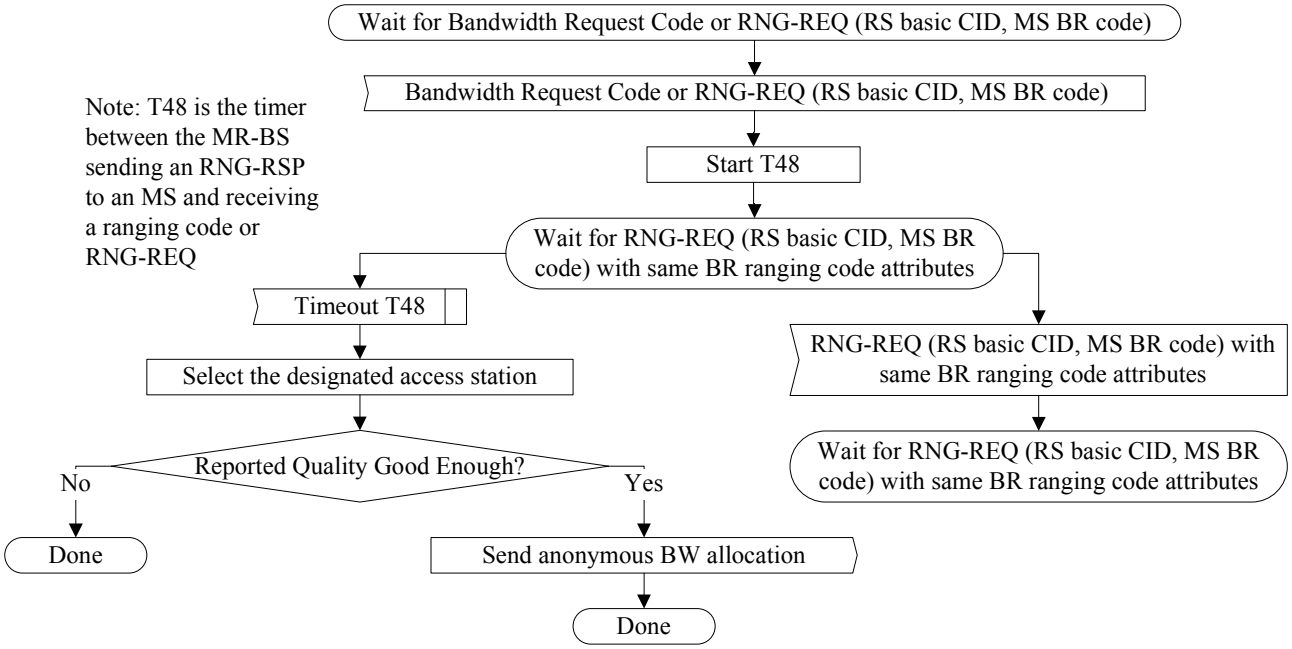


Figure yyy MS CDMA-based Bandwidth Request with Transparent RS – MR-BS

Insert the following rows into Table 342 at 10.1 Global Values:

Table 342—Parameters and constants

System	Name	Time reference	Minimum value	Default value	Maximum value
MR-BS	T48	Wait for RNG-REQ from the subordinate RS	tbd	tbd	

Insert the following rows into Table 364 at 11.5 RNG-REQ TLV:

Table 364—RNG-REQ message encodings

Name	Type (1 byte)	Length	Value (variable-length)	PHY Scope
Received Ranging Codes	TBA	Variable	Received Ranging Codes is a compound TLV value that indicates received code information.	OFDMA
Timing Adjust	TBA.1	4	Tx timing offset adjustment (signed 32-bit). The amount of time required to adjust SS	OFDMA

			transmission so the bursts will arrive at the expected time instance at the BS. Units are PHY specific (see 10.3).	
Power Level Adjust	TBA.2	1	Tx Power offset adjustment (signed 8-bit, 0.25 dB units). Specifies the relative change in transmission power level that the SS is to make in order that transmissions arrive at the BS 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.3	4	Tx frequency offset adjustment (signed 32-bit, Hz units). Specifies the relative change in transmission frequency that the SS is to make in order to better match the BS. (This is fine-frequency adjustment within a channel, not reassignment to a different channel.)	OFDMA
Ranging Status	TBA.4	1	Used to indicate whether uplink messages are received within acceptable limits by BS. 1 = continue, 2 = abort, 3 = success	OFDMA
Ranging code attributes	TBA.5	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. Bits 15:8 – Used to indicate the ranging code index that was sent by the SS. Bits 7:0 – The 8 least significant bits of the frame number of the OFDMA frame where the SS sent the ranging code.	OFDMA
Channel Measurement Information	TBA.6	TBA	TBD	