| Project | IEEE 802.16 Broadband Wireless Access Working Group |<http://ieee802.org/16>| |
|---|---|---|
| Title | MS CDMA-based BR with Non-transparent RS |
| Date Submitted | 2006-01-08 |
| Source(s) | 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. |
| | Hang Zhang, Peiying 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 |
| | [add co-authors here] |
| 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 non-transparent RS |
| Purpose | Text proposal for 802.16j Baseline Document |
| Notice | This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |
| Release | The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE’s name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE’s sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16. |
| Patent Policy and Procedures | The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance. |
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>.  

1
Introduction

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

6.3.6.8.2 Contention-based CDMA Bandwidth Requests with non-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.

Upon receiving RLY_RC-REP with success status from a subordinate RS, the BS shall provide (an implementation dependent) uplink allocation for the SS by transmitting an RLY-BST to the RS. Afterward, the RS should construct CDMA allocation IE, which specifies the transmit region and Ranging Code that were used by the SS from received RLY-BST message and send it to the corresponding 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

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLY-BST_Message_Format(){}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management Message Type = xx</td>
<td>8 bits</td>
<td></td>
</tr>
<tr>
<td>Encoded Information</td>
<td>variable</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table xxx – RLY_RC-REP message format

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLY_RC-REP_Message_Format(){}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management Message Type = xx</td>
<td>8 bits</td>
<td></td>
</tr>
</tbody>
</table>
### Table xxx – RLY_RC-REP message encodings

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Value</th>
<th>PHY Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranging Status</td>
<td>TBA</td>
<td>1</td>
<td>Used to indicate whether uplink messages are received within acceptable limits by RS. 1 = continue, 2 = abort, 3 = success</td>
</tr>
<tr>
<td>Received Ranging Code Attributes</td>
<td>TBA</td>
<td>4</td>
<td>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 MS. Bits 7:0 – The 8 least significant bits of the frame number of the OFDMA frame where the MS sent the ranging code.</td>
</tr>
</tbody>
</table>
Table xxx: MS CDMA Bandwidth Request procedure in non-transparent RS systems

<table>
<thead>
<tr>
<th>MR-BS</th>
<th>RS</th>
<th>MS/SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send RLY-BST which includes MAP containing Ranging Region information</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>Derive map from received RLY-BST</td>
<td>Send map containing Ranging Region information</td>
</tr>
<tr>
<td>UL-MAP</td>
<td>Transmit randomly selected Ranging code in a randomly selected Ranging Slot from available Ranging Region</td>
<td></td>
</tr>
<tr>
<td>[Receive Ranging Code]</td>
<td>Report MS/SS BR ranging code and measurement results to MR-BS</td>
<td>Status = Success</td>
</tr>
<tr>
<td>RLY_RC-REP</td>
<td>Send map containing anonymous BW allocation with original Ranging Code and Ranging Slot</td>
<td>Status = Success</td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Derive map from received RLY-BST</td>
<td>Send map containing anonymous BW allocation with original Ranging Code and Ranging Slot</td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send RLY-BST which includes MAP containing anonymous BW allocation with original Ranging Code and Ranging Slot</td>
<td>Status = Success</td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send RLY-BST which includes MAP containing anonymous BW allocation with original Ranging Code and Ranging Slot</td>
<td>Status = Success</td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send RLY-BST which includes MAP containing anonymous BW allocation with MS Basic CID</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive Relaying data]</td>
<td>Forward the BR to MR-BS</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send map containing anonymous BW allocation with MS Basic CID</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send map containing anonymous BW allocation with MS Basic CID</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send map containing anonymous BW allocation with MS Basic CID</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send map containing anonymous BW allocation with MS Basic CID</td>
<td></td>
</tr>
<tr>
<td>RLY-BST</td>
<td>[Receive RLY-BST]</td>
<td></td>
</tr>
<tr>
<td>[Receive RLY_BST]</td>
<td>Send map containing anonymous BW allocation with MS Basic CID</td>
<td></td>
</tr>
</tbody>
</table>
Wait for Bandwidth Request Code

Bandwidth Request Code

No

Good enough?

Yes

Done

Send RLY_RC-REP to MR-BS

Done

Figure xxx MS CDMA Bandwidth Request – Non-transparent Access RS (part 1)

Wait for anonymous BW allocation (UL-MAP info) in RLY-BST

RLY-BST with anonymous BW allocation

Send anonymous BW allocation to MS

Wait for BR on the burst specified by CDMA Allocation IE

Figure xxx MS CDMA Bandwidth Request – Non-transparent Access RS (part 2)

Wait for BR on the burst specified by CDMA Allocation IE

BR\(\text{Transport CIC}^*\)

Relaying BR to MR-BS

Done

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

Wait for RLY_RC-REP

RLY_RC-REP

No

Good enough?

Yes

Done

Send anonymous BW allocation (UL-MAP info) in RLY-BST

Done

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