

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Procedures supporting MS movement among access stations with same preamble/FCH/MAP	
Date Submitted	2007-3-13	
Source(s)	Ray-Guang Cheng National Taiwan University of Science and Technology 43, Sec. 4, Keelung Rd. Taipei, TAIWAN	Email: crg@mail.ntust.edu.tw Voice: +886-2-27376371
	Fang-Ching Ren, Chie-Ming Chou, Kun-Ying Hsieh ITRI, TAIWAN	Email: frank_ren@itri.org.tw
	David Comstock, John Lee, Zheng Shang, Jingning Zhu Huawei Technologies No.98, Lane91, Eshan Road, Shanghai, P.R.C	Email: dcomstock@huawei.com Voice: +1 858 735 9382
	Gang Shen, Kaibin Zhang, Shan Jin Alcatel-Lucent, Research & Innovation 388#, Ningqiao Road, Shanghai, P. R. C.	Email: gang.a.shen@alcatel-sbell.com.cn Voice: 86-21-50551240-8194 Fax: 86-21-50554554
	Mo-Han Fong, Gamini Senarath, Peiyong Zhu, Wen Tong Nortel 3500 Carling Avenue Ottawa, Ontario, Canada K2H 8E9	Email: mhfong@nortel.com Voice: +1 613 7658983
	Hyunjeong Kang, Hyoung Kyu Lim, Jungje Son Samsung Electronics	Email: hyunjeong.kang@samsung.com
Re:	IEEE 802.16j-07/007r2: "Call for Technical Comments and Contributions regarding IEEE Project 802.16j"	
Abstract	This document provides the handover procedure and corresponding MAC management messages over relay links so that a legacy IEEE 802.16e MS can handover seamlessly within an IEEE 802.16j network.	
Purpose	This contribution is provided as input for the IEEE 802.16j amendment.	
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	

2007-3-13

IEEE C802.16j-07/174r1

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>>.

Procedures supporting MS movement among access stations with same preamble/FCH/MAP

1. Introduction

In this proposal, we propose text regarding to the MS centralized HO procedure for MS movement among access stations with same preamble/FCH/MAP in an MR network. This proposal is a harmonized version of the proposals [1]-[3].

2. Proposed texts

-----Start of text proposal-----
6.3.22.5.2 MS Movement among access stations with same preamble/FCH/MAP

In this case, MS is not aware of the HO. Therefore, RS and MR-BS shall perform measurement of MS signal quality to assist MS movement among stations (RS, MR-BS) that share the same preamble/FCH/MAP.

[Insert the following subclause and text into the end of the first paragraph]

The stations (RS or MR-BS) which share the same preamble/FCH/MAP form a virtual group (VG). All stations (RSs and MR-BS) in the VG shall measure the signal quality (RSSI, CINR) and the Timing Adjust (TA) for ~~all~~ each active MSs served by this VG to support MS mobility within the VG. All RSs shall use MOB_RSSCN-REP to provide MR-BS with the selected report metrics (RSSI and/or CINR and TA) for each active MS when needed.

The MOB_RSSCN-REP is sent to the MR-BS using the reporting modes specified by MR-BS. ~~TEither one of the following two reporting modes shall be supported by RSs shall be used.~~

<Section note: the configuration of the reporting mode is specified by MR-BS during RS initiation. This is TBD.>

6.3.22.2.5.2.1 Mode 1

In Mode 1, the access RS shall automatically report its measurement result to MR-BS in an event-triggered or periodic way.

- For event-triggered reporting, the access RS shall report its measurement results if the power or timing requirement for the specific MS is not satisfied. The access RS may use the RS bandwidth request and allocation mechanism defined in section 6.3.6.7 to request uplink resource for sending MOB_RSSCN-REP.
- For periodic reporting, the access RS shall send MOB_RSSCN-REP every REP_INT and the MR-BS shall periodically allocate uplink resource for the access RS to report the latest measurement results for ~~sub-ordinate~~ each active MSs.

<Section note: REP_INT is the reporting interval specified in the RS configuration. This is TBD.>

In Mode 1, non-access RSs shall report their measurement results ~~only~~ if MOB_RSSCN-RSP message is received. The MR-BS shall send MOB_RSSCN-RSP message to request all or part of RSs in the same VG to report their measurement results for a specific MS. The MR-BS shall allocate uplink resource for the selected non-access RSs to send their MOB_RSSCN-REPs at the frame specified in MOB_RSSCN-RSP.

6.3.22.2.5.1.2 Mode 2

In Mode 2, all RSs (access RS and non-access RSs) in the same VG shall automatically report the measurement results to MR-BS in an event-triggered way. Each RS shall send an MOB_RSSCN-REP to MR-BS if the measured RSSI/CINR going-up cross T_ADD[i] (i=0,...,max), or going-down cross the

T_DEL[i] (i=0,...,max), or the difference between the current measured TA and the previous reported TA exceeds TA_DIFF. The RS may use the RS bandwidth request and allocation mechanism defined in section 6.3.6.7 to request uplink resource for sending their MOB_RSSCN-REP. The MR-BS shall maintain the measurement reports for each active MS and use those information to speedup optimal target access station selection.

<Section note: T_ADD[i], T_DEL[i] (i=0,...,max), and TA_DIFF are threshold values specified in the configuration of the reporting mode during RS initiation. This is TBD.>.

MR-BS may select a new target RS based on the measurement results and use ~~MOB_RNG-RSP~~ to adjust the timing and the power level of the MS, in order to fulfill the handover procedure.

6.3.2.3 MAC management messages

[Add the columns into Table 14 as indicated.]

Table 14—MAC Management messages

Type	Message name	Message description	Connection
69	MOB_RSSCN-REP	RS scanning report	Basic
70	MOB_RSSCN-RSP	Intra-VG HO trigger message	Basic

[Insert the following subclause and text into this section]

6.3.2.3.62 MOB_RSSCN-REP message

RS in VG may use MOB_RSSCN-REP message to report the measurement results to MR-BS. The message shall be transmitted on the Basic Management CID of the RS.

The format of the MOB_RSSCN-REP message is depicted in Table A.

Table A-MOB_RSSCN-REP message format

MOB_RSSCN-REP Message format(){	--	--
Management Message Type=69	8 bits	--
N_CIDMS	8 bits	Number of CIDMS to be reported
Report metric	3 bits	Bitmap indicating presence of certain metrics: Bit 0: MS RSSI mean Bit 1: MS CINR mean Bit 2: Timing Adjust
Padding	5 bits	--
For (j=0; j<N_CIDMS; j++){	--	--
Basic MS CID	16 bits	Basic CID of measured the MS to be reported
If (Report metric [Bit 0]==1)		
MS RSSI mean	8 bits	The value shall be interpreted as an unsigned byte with units of 0.25 dB, such that 0x00 is interpreted as -103.75 dBm, an RS shall be able to report values in the range -103.75 dBm to -40 dBm.
If (Report metric [Bit 1]==1)	--	--
MS CINR mean	8 bits	<Note: The range and encoded value encoding of CINR is TBD.>
If (Report metric [Bit 2]==1)	--	--

<u>Timing Adjust</u>	<u>32 bits</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 MR-BS or RS. Units are PHY specific (see 10.3).</u>
<u>}</u>	<u>--</u>	<u>--</u>
<u>}</u>	<u>--</u>	<u>--</u>

6.3.2.3.63 MOB_RSSCN-RSP message

If the reporting Mode 21 is used, an MR-BS shall transmit MOB_RSSCN-RSP message to request all or part of RSs in the same VG for reporting their measurement results. This message shall be transmitted by multicast manner for all RSs in the same VG.

The format of the MOB_RSSCN-RSP message is depicted in Table B.

Table B-MOB_RSSCN-RSP message format

<u>MOB_RSSCN-RSP_Message_format(){</u>	<u>--</u>	<u>--</u>
<u>Management Message Type=70</u>	<u>8 bits</u>	<u>--</u>
<u>MS_CID</u>	<u>16 bits</u>	<u>Basic CID of the MS that requested to report its measurement result</u>
<u>N_CID</u>	<u>8 bits</u>	<u>Number of CIDs that the corresponding MSs to be scanned</u>
<u>Report metric</u>	<u>3 bits</u>	<u>Bitmap indicating presence of certain metrics: Bit 0: MS RSSI mean Bit 1: MS CINR mean Bit 2: Timing Adjust</u>
<u>Report Frame</u>	<u>5-4 bits</u>	<u>The measurement result is reported from the frame in which this message was received. A value of zero means that MOB_RSSCN-REP is sent in the next frame.</u>
<u>RS_Report_Type</u>	<u>1 bit</u>	<u>'0': Part of RSs in the same VG shall report '1': All RSs except for the access RS in the same VG shall report</u>
<u>If (RSID_Type==0){</u>		
<u> N_RS</u>	<u>8 bits</u>	<u>Number of RSs that need to report the measurement results</u>
<u> For (j=0; j<N_RS; j++){</u>	<u>--</u>	<u>--</u>
<u> RSCIDBasic_CID</u>	<u>16 bits/16 bits</u>	<u>Basic CID of the RS that needs to report the measurement result for the specified MSBasic_CID of the selected MSs</u>
<u> }</u>		
<u>}</u>	<u>--</u>	<u>--</u>

-----End of text proposal-----

3. Reference

- [1] Ray-Guang Cheng, Fang-Ching Ren, Chie-Ming Chou, and Kun-Ying Hsieh, "Proposal for MS handover procedure in an MR network," IEEE C802.16j-07/047r1, IEEE 802.16 meeting, January 2007.
- [2] David Comstock, John Lee, Zheng Shang, Jingning Zhu, "MS handover support in transparent RS," IEEE S802.16j-07/165, IEEE 802.16 meeting, January 2007.
- [3] Gang Shen, Kaibin Zhang, and Shan Jin, "MS handover support in transparent / non-transparent relay

mode," IEEE C802.16j-07/146, IEEE 802.16 meeting, January 2007.

-