Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	RS Handover	
Date Submitted	2007-01-08	
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Re:	A response to a Call for Technical Proposal, http://wirelessman.org/relay/docs/80216j-06_034.pdf	
Abstract	In this contribution, we propose the additional handover operations for two modes of moving RS.	
Purpose	To incorporate the proposed text into the P802.16j Baseline Document (IEEE 802.16j-06/026r1)	
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Relay Station Handover

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1. Introduction

In contribution [1], two modes of moving RS operation are proposed: moving RS (MRS) mode and moving BS (MBS) mode. The handover procedures of these two modes are different. In this contribution, we propose the handover operation for these two modes of moving RS.

2. Proposal

2.1 Moving RS mode

For a moving RS in MRS mode, the RS shall perform handover procedure as follows:

- Handover initiation
  - At a time when a moving RS decides to perform handover, the RS send MOB_MSHO-REQ to the associated serving MR-BS.
  - The MR-BS shall reply with MOB_BS_RSP to the RS.
  - At the same time the MR-BS sends MOB_BSHO_REQ message to each of MS served by this moving RS to force a handover of the impacted MS.
  - All impacted MS(s) shall reply with MOB_IND messages to MR-BS
  - The moving RS shall simply relay those messages on the link between the MR-BS and the RS
- Handover
  - When a moving RS switches to the target station, the RS shall perform other handover processes for itself per 6.3.22.2 defined for post-handover processes
  - Then, the all attached MS(s) perform other handover processes per 6.3.22.2 defined for post-handover processes. RS relays those messages on the link between the target MR-BS and the RS

2.2 Moving BS mode

For a moving RS in moving BS mode, the RS shall perform handover per 6.3.22.2. After handover of the RS finishes, the RS shall facilitate the handover of its attached MS(s).

- If the RS have entered into new subnet, all served MSs' IP addresses need to be re-established. The IP re-establishment processes of MS(s) are the same as defined in the current standard. The RS, however, can

encapsulate the data from multiple secondary connections of MS(s) into a single message called RS_mobile_IP_re_est-REQ message. This message is sent to the target MR-BS over a transport connection of the RS. The MR-BS uses RS_mobile_IP_re-est-RSP to encapsulate the IP address related messages of MS(s) and transmit this message over a DL transport connection of this moving RS. An alternative solution is to establish a secondary connection for a moving RS in moving BS mode dedicated used for relaying MSs' protocol related messages

- When a moving RS enters into a different paging Zone, the moving RS may perform the location update on-behalf of idle MS served
- Other processes of post handover shown in Figure 130b are not required

3. Proposed text change

++++++++++++++++++Start Text ++

3.1 RS handover

[Insert a new section 6.3.22.2]

6.3.22.2 RS handover

Two moving modes are defined for a moving RS: moving RS mode and moving BS mode. The handover procedures for these two modes are described in this section.

6.3.22.2.1. Moving RS mode

For a moving RS in MRS mode, the RS shall perform handover procedure for as follows:

- Handover initiation
  - At the time when a moving RS decides to perform handover, the RS sends MOB_MSHO-REQ to the associated serving MR-BS.
  - The MR-BS shall reply with MOB_BS_RSP to the RS.
  - At the same time the MR-BS sends MOB_BSHO_REQ message to each of MS served by this moving RS to force a handover of the impacted MS.
  - All impacted MSs shall reply with MOB_IND messages to MR-BS
  - The moving RS shall simply relay those messages on the link between the target MR-BS and the RS

- Handover
  - When a moving RS switches to the target station, the RS shall perform other handover processes for itself per 6.3.22.2 defined for post-handover processes
  - Then, the all attached MSs perform other handover processes per 6.3.22.2 defined for post-handover processes. RS relays those messages on the link between the target MR-BS and the RS

6.3.22.2.2 Moving BS mode

For a moving RS in moving BS mode, the RS shall perform handover per 6.3.22.2. After handover of the RS finishes, the RS shall facilitate the MS(s) handover

- If the RS have entered into new subnet, all served MSs' IP addresses shall be re-established. The IP re-establishment processes of MS(s) are the same as defined in the current standard. The RS shall encapsulate the data from multiple secondary connections of MS(s) into a single message called RS_mobile_IP_re_est_request message. This message shall be sent to the target MR-BS over a transport connection of the RS. The MR-BS shall use RS_mobile_IP_re_est_response to encapsulate the IP address related messages of MS(s) and transmit this message over a DL transport connection of this moving RS.
- If the moving RS enters a new paging zone, the RS shall perform the location update on behalf of MS(s) in idle mode using RS_mobile_info update request message. MR-BS shall send RS_mobile_info update response message to confirm the location update.
- Other processes of post handover shown in Figure 130b are not required

3.2 Message format for IP address re-establishment of MS(s) served by a moving RS during handover

A new MAC management messages are introduced for the purpose of IP address re-establishment of MS(s) served by a moving RS in MBS mode during handover.

[Modify the last row in Table 14 in page 46 as follows]

Type	Message name	Message description	Connection
~~62-255~~67	RS_mobile_IP_re_est request	Encapsulation of IP address establishment related messages of MSs (used by RS)	UL transport connection of a moving RS in moving BS mode
68	RS_mobile_IP__re_est response	Encapsulation of IP address establishment related messages of MSs (used by MRBS)	DL transport connection of a moving RS in moving BS mode
69	RS_mobile_info_update_request	Report of mobiles's information (used by RS)	UL basic connection of a RS
70	RS_mobile_info_update_response	Confirmation of receotion of report of mobiles's information (used by MRBS)	DL basic connection of a RS
71-255		Reserved	

[Add new sections 6.3.2.3.62 and 6.3.2.3.63 after section 6.3.2.3.61 in page 172]

6.3.2.3.62 Mobile IP address re-establishment request message

This massage is used for a RS to consolidate multiple MS IP establishment related messages for sending to a MR-BS when IP address re-establishments for MSs are required. The message format is shown in Table xxx

Table XXX. RS mobile IP re-est request (RS_mobile_IP_re_est-REP) message format.

Syntax	Size	Notes
RS_mobile_IP_re_est request format {		
_Management message type = 67	8 bits	
_Number of messages	4 bits	
_For (i = 0; Number of messages; i++) {		
__Length	8 bits	Indicates the length in bytes of each message in the body part
}		
Messages	Variable	IP protocol messages
}		

6.3.2.3.63 Mobile IP address re-establishment response message

This massage is used for a MRBS to consolidate multiple MS IP establishment related messages for sending to a moving RS in moving BS mode as a response to RS_mobile_IP_re-est-REQ message when IP address re-establishments for MSs are required. The message format is shown in Table xxx

Table XXX. RS mobile IP re-est response (RS_mobile_IP_re-est- RSP) message format.

Syntax	Size	Notes
RS_mobile_IP_re-est response format {		
_Management message type = 68	8 bits	
_Number of messages	4 bits	
_For (i = 0; Number of messages; i++) {		
__Length	8 bits	Indicates the length in bytes of each message in the body part
}		
Messages	Variable	IP protocol messages
}		

3.3 Location update for idle MS(s) served

[Add new sections 6.3.2.3.64 and 6.3.2.3.65]

6.3.2.3.64 Mobile Information update request message

This message is used for a RS to report any mobile related information to MR-BS.
This massage can be used for a moving RS in moving BS mode to report MAC addresses of idle MSs when a moving RS enters a new paging zone. The purpose of this is for DL traffic routing to a MS which is in idle mode and connected to a moving RS. The message format is shown in Table xxx

Table XXX. RS mobile info update request (RS_mobile_info- REQ) message format.

Syntax	Size	Notes
RS_mobile_info update request format {		
Management message type = 69	8 bits	
Info_type	4 bits	0000: Idle MS MAC address 0001-1111: reserved
Transetion ID	4 bits	
If (Info_type == 0000) {		
Number of MAC addresses	4	Indication of number of MAC addresses included
For (i = 0; Number of addresses; i++) {		
MAC address	48	Idle MS MAC address
}		
}		
}		

6.3.2.3.65 Mobile Information update response message

This message is used for a MR-BS to confirm the reception of RS_mobile_info_update request message sent by a RS. The message format is shown in Table xxx

Table XXX. RS mobile info update response (RS_mobile_info- RSP) message format.

Syntax	Size	Notes
RS_mobile_info update response format {		
Management message type = 69	8 bits	
Info_type	4 bits	0000: Idle MS MAC address 0001-1111: reserved
Transetion ID	4 bits	
}		
}		

++++++++++++++++++End Text ++

Reference

[1] IEEE 802.16j-07/087 “Moving Relay Station Operation”, Jan.8, 2007