Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Clarifications for MS handover procedure among access stations with same preamble/FCH/MAP**
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Re:	IEEE 802.16j-06/019:"Call for Technical Comments Regarding IEEE Project 802.16j "
Abstract	This contribution describes the remedy and required messages to clarify for MS handover procedure among access stations with same preamble/FCH/MAP defined in IEEE 802.16j-06/026r4.
Purpose	To make IEEE Project 802.16j more maturity
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Remedy of MS Movement among access stations with same preamble/FCH/MAP

1. Problem Statement

In [1], subclause 6.3.22.5.2 specifics two operation modes for MS movement among access stations with same preamble/FCH/MAP where the access RSs forms a RS group defined in subclause 6.3.9.16.3.1. However the messages required for the configuration of RS regarding to the reporting modes and the corresponding parameters are not clearly defined.

2 Suggested Remedy

The configuration of the reporting mode is done during RS network entry and initialization. MR-BS shall use RS_Config-REQ message to configure the reporting mode and the related parameters of the RS.

3 Proposed Text Change

----------Start text proposal----------

[*Adopt the following modifications into the P802.16j baseline document*]

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 (RSs, MR-BS) that share the same preamble/FCH/MAP.

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 each active MS served by ~~this VG~~ these stations to support MS mobility ~~within the VG~~ among these stations. 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. Two reporting modes shall be supported by RSs. The reporting mode and related reporting parameters is configured in RS_Config-REQ in subclause 6.3.2.3.67

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

MR-BS may select a new target RS based on the measurement results and use RNG-RSP to adjust the timing and the power level of the MS, in order to fulfill the handover procedure. To update the access stations, MR-BS shall send RS_Member_List_Update message defined in subcluase 6.3.2.3.89 to notify the corresponding RSs the changes of data forwarding status for specified MSs.

6.3.22.5.2.1 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 at least one of power, CINR, 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 which is specified in RS_Config-REQ message and the MR-BS shall periodically allocate uplink resource for the access RS to report the latest measurement result for each active

MS.

~~<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 RS group~~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.

6.3.22.5.2.2 Mode 2

In Mode 2, all RSs (access RS and non-access RSs) in the same RS group~~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 where T_ADD[i], T_DEL[i] (i=0,…,max), and TA_DIFF are specified in the RS_Config-REQ message during RS initiation. 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 RNG-RSP to adjust the timing and the power level of the MS, in order to fulfill the handover procedure.~~

6.3.2.3.67 MR-BS configuration Request message

Table 183f-RS_Config-REQ message format

Syntax	Size	Notes

RS_Config_REQ format {		
Management message type = 67	8 bits	

Configured_para_type	8 bits	b0= 1: preamble configuration is included;
		b1= 1: remove multicast RSID to disassociate from the RS group;
		b2 = 1: Unicast RSID is included;
		b3 = 1: Multicast RSID is included;
		b4 = 0; Do not transmit preamble; 1: transmit the assigned preamble.
		b5 = 1: R-amble configuration is included
		b6 – b7: reserved

If (b0 of Configured_para_type == 1) {		
Preamble_index	8 bits	Assign a preamble index value to the potential RS
}		
If (b2 of Configured_para_type == 1) {		
Unicast RSID	8 bits	Unicast RSID
}		
If (b3 of Configured_para_type == 1) {		Setting required operation parameters within a RS group
Multicast RSID	8 bits	Multicast RSID as the RS Group ID
Reporting_configured_type	8 bit	b0=0: mode 1 b0=1: mode 2 b1=0: event-triggered reporting for access RS in mode 1 b1=1: periodic reporting for access RS in mode 1 b2~b7: reserved

If (b0 of Reporting_configured_type == 0) {		Mode1 configurations
If (b1 of Reporting_configured_type == 0) {		Access RS perform event-triggered reporting.
RSSI_threshold	8 bits	The access RS shall report the measurement result of a MS if the RSSI of the MS exceeds RSSI threshold. The value shall be interpreted as an unsigned byte with units of 0.24dB, such that 0x00 is interpreted as -103.75 dBm, an RS shall be able to report values in the range -103.75dBm to -40 dBm
CINR_threshold	8 bits	The access RS shall report the measurement result of a MS if the CINR of the MS exceeds CINR threshold.CINR threshold shall be interpreted as a single value from –16 dB to 47.5dB in units of 0.5dB.
TA_DIFF threshold	32 bits	The access RS shall report the measurement result of a MS if the TA difference of the MS exceeds TA_DIFF threshold. The range and units of TA_DIFF threshold are the same as specifications of Tx timing offset adjustment (signed 32-bit).
}		
else {		Access RS performs periodic reporting.
REP_INT	8 bits	The reporting interval for periodic reporting, in unit of frame.
}		
}		
else {		Mode 2 configurations
Selected triggered metrics	3 bits	Bitmap indicating certain metrics is used for event triggered: Bit 0: enable RSSI-based event-trigger Bit 1: enable CINR-based event-trigger Bit 2: enable TA-based event-trigger
If (selected triggered metrics[Bit0]==1){		

N_RSSI	8 bits	Number of reporting add/delete thresholds for RSSI
For (i=0; i<N_RSSI; i++)		
RSSI_T_ADD [i]	8 bits	This RSSI value specifies the add threshold to trigger reporting
RSSI_T_DEL [i]	8 bits	This RSSI value specifies the delete threshold to trigger RS reporting
}		
}		
If (selected triggered metrics[Bit1]==1){		
N_CINR	8 bits	Number of reporting add/delete thresholds for CINR
For (i=0; i<N_CINR; i++) {		
CINR_T_ADD [i]	8 bits	This CINR value specifies the add threshold to trigger reporting. The CINR value shall be interpreted from –16 dB to 47.5dB in units of 0.5dB.
CINR_T_DEL [i]		
}		
}		
If (selected triggered metrics[Bit2]==1){		
TA_DIFF	32 bits	The access RS shall report the measurement result of a MS if the TA difference of the MS exceeds TA_DIFF threshold. The range and units of TA_DIFF threshold are the same as specifications of Tx timing offset adjustment (signed 32-bit).
}		
}		
}		
If (b5 of Configuration_para_type == 1) {		
R-amble_index	8 bits	R-amble index
}		
TLV Encoded Information	Variable	TLV specific
}		

6.3.2.3.79 MOB_RSSCN-REP message

[*Change the first paragraph in subcluase* **6.3.2.3.79** *as follows.*]

RS in RS group~~VC~~ 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.

[*Change the text in Table 183t as indicated:*]

Table 183t—MOB_RSSCN-REP message format

Syntax	Size	Notes
MS CINR mean	8 bits	~~<Note: The range and encoded value of CINR is TBD>~~ MS CINR mean shall be interpreted as a single value from –16 dB to 47.5dB in units of 0.5dB.

6.3.2.3.80 MOB_RSSCN-RSP message

[*Change the first paragraph in subcluase* **6.3.2.3.80** *as follows.*]

If the reporting Mode 1 is used, an MR-BS shall transmit MOB_RSSCN-RSP message to request all or part of RSs in the same RS group~~VC~~ for reporting their measurement results. This message shall be transmitted by multicast manner for all RSs in the same RS group~~VC~~.

[*Change the text in Table 183u as indicated:*]

Table 183u—MOB_RSSCN-RSP message format

Syntax	Size	Notes
RS_Report_Type	1 bit	“0”: Part of RSs in the same RS group~~VC~~ shall report “1”: All RSs except for the access RS in the same RS group~~VC~~ shall report

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