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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** | |
| Title | **Clarification on proactive operation of multimode HR-MS over IEEE 802.16.1a** | |
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| Source(s) | Seokjoo Shin  Chosun University  Won-Ik Kim, Eunkyung Kim, Miyoung Yun, Seokki Kim, Sungkyung Kim, Hyun Lee, Chulsik Yoon, Sungcheol Chang  ETRI | E-mail:  [sjshin@chosun.ac.kr](mailto:sjshin@chosun.ac.kr)  [woniks@etri.re.kr](mailto:woniks@etri.re.kr)  [scchang@etri.re.kr](mailto:scchang@etri.re.kr) |
| Re: | “IEEE 802.16-12-400-00-Gdoc,” in response to Letter Ballot Recirc #38b on P802.16.1a/D3 | |
| Abstract | This provides AWD text proposals for clarification on proactive operation of multimode HR-MS over IEEE 802.16.1a | |
| Purpose | To discuss and adopt the proposed text in the draft amendment document on GRIDMAN | |
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**Clarification on proactive operation of multimode HR-MS over IEEE 802.16.1a**

Seokjoo Shin

Chosun University

Won-Ik Kim, Eunkyung Kim, Miyoung Yun, Seokki Kim, Sungkyung Kim, Hyun Lee, Chulsik Yoon, Sungcheol Chang

ETRI

# Introduction

In Section 6.12.1.3.1 Proactive Operation, the procedures and messages for HR-MS to change a role of BS in proactive manner are elaborated. However, there are unnecessary procedures and undefined message field.

In this contribution, we modified or removed those sentences in order to make the text clearer. Basically role change from HR-MS to HR-BS is governed by the superordinate HR-BS in proactive operation. The current standard defines that the target HR-MS starts its BS mode in either action time expiration or given trigger condition. Role change based on action time is reasonable because the superordinate HR-BS should be aware of the exact time of HR-MS’s role change.

On the other hand, the trigger condition is not necessary in this proactive operation. The point is that the trigger conditions shown in the current standard are not fit to this proactive operation. Without any suggestion of new trigger condition for proactive operation, we suggest the removal of it from the text. In addition, reactive operation may implicitly cover the trigger based operation.

# References

[1] IEEE P802.16nTM/D3, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.

[2] IEEE P802.16.1aTM/D3, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.

[3] EEE P802.16Rev3/D6, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems,” June 2012.

[4] IEEE P802.16.1TM/D6, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, June 2012.

# Proposed Text for the 802.16.1a AWD

Note:

The text in **BLACK** color: the existing text in the 802.16.1a AWD

The text in **~~RED~~** color: the removal of existing 802.16.1a AWD

The text in **BLUE** color: the new text added to the 802.16.1a AWD

[-------------------------------------------------Start of Text Proposal---------------------------------------------------]

***[Remedy1: Modify the sentences in Section 6.12.1.3.1 in IEEE P802.16.1a/D3.]***

***[Page# 117, Line# 10]***

**6.12.1.3 Base station function for HR-MS**

**…**

**6.12.1.3.1 Proactive Operation**

A superordinate HR-BS may select a target HR-MS among its subordinate HR-MSs which are capable of role changing to HR-BS, according to the measured signal power at HR-BS and/or subordinate HR-MS' status information such as the battery level. ~~The superordinate HR-BS may transmit AAI-MM-ADV message with trigger condition for which the subordinate HR-MSs capable of role changing to HR-BS shall report its status information.~~ The superordinate HR-BS shall transmit AAI-MM-ADV message with action type set to 0b1011 for obtaining the status information of the subordinate HR-MSs. ~~When the trigger condition is met,~~ Upon receiving the AAI-MM-ADV message with action type set to 0b1011, the subordinate HR-MS capable of role changing to HR-BS ~~may report~~ reports its status information to the superordinate HR-BS via AMS Battery Level Report header as described in 6.2.2.1.3.5. In addition, the subordinate HR-MS may transmit AAI-SCN-REP message according to the scanning request by the superordinate HR-BS.

After selecting the target HR-MS, the superordinate HR-BS requests the target HR-MS to change its mode to HR-BS by transmitting AAI-MM-BS-REQ message. The AAI-MM-BS-REQ message may include PHY operational parameters recommended by the superordinate HR-BS. If the target HR-MS accepts the request from the superordinate HR-BS to change the mode to HR-BS, it shall transmit AAI-MM-BS-RSP message to the superordinate HR-BS when it is ready to start HR-BS role.

After receiving the AAI-MM-BS-RSP message, the superordinate HR-BS shall transmit AAI-MM-BS-CMD message to the target HR-MS to inform the ~~action~~ time ~~or trigger conditions~~ for starting as HR-BS mode. If the action time for mode change are included in the AAI-MM-BS-CMD message, the target HR-MS starts the HR-BS mode operation upon expiring the action time. At the same time, the superordinate HR-BS may stop the HR-BS role in order to avoid potential interference ~~from the target HR-MS~~ to the HR-MS acting as HR-BS. ~~If the trigger type is 0b1, trigger conditions for mode change shall be included in the AAI-MM-BS-CMD message and the mode change to HR-BS role starts after trigger event. One possible use is to prepare against an unforeseeable SPOF event, e.g., a HR-BS failure. The trigger shall be canceled if the target HR-MS performs a handover to other infrastructure stations.~~

If handover of subordinate MSs connected to the superordinate HR-BS is necessary, the superordinate HR-BS may transmit AAI-L2-XFER message which contains MS context information before sending AAI-MM-BS-CMD message to the target HR-MS.

***[Remedy2: Change the table 106h in Section 6.2.3.65.8 in IEEE P802.16.1a/D3.]***

***[Page# 64, Line# 3]***

**6.2.3.65.8 AAI-MM-BS-CMD**

To inform the time for starting HR-BS role, the AAI-MM-BS-CMD message shall be sent from superordinate HR-BS to the multimode HR-MS. ~~The trigger condition indicates when a HR-MS shall initiate a mode change to BS. See Table 118.~~

**Table 106h – AAI-MM-BS-CMD message field description**

|  |  |  |  |
| --- | --- | --- | --- |
| **~~Field~~** | **~~Size~~**  **~~(bits)~~** | **~~Value/Description~~** | **~~Condition~~** |
| ~~Trigger type~~ | ~~1~~ | ~~0b0: Start HR-BS mode after expiring action time~~  ~~0b1: Start HR-BS mode upon reaching trigger conditions~~ |  |
| ~~If (Trigger type == 0b0)~~ |  |  |  |
| ~~Action time~~ | ~~4~~ | ~~This is the wait time in units of 100 ms before the HR-MS starts to perform HR-BS mode. The multimode HR-MS shall start HR-BS mode at the action time expires.~~ |  |
| ~~} else {~~ |  |  |  |
| ~~Trigger condition~~ | ~~variable~~ | ~~Triggers defined in Table 118.~~ |  |
| ~~}~~ |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Size**  **(bits)** | **Value/Description** | **Condition** |
| Action code | 1 | 0b0: Start HR-BS mode operation at Action time  0b1: Start HR-BS mode operation immediately |  |
| If (Action code == 0b0) { |  |  |  |
| Action time | 4 | This is the waiting time in units of 100 ms before the HR-MS starts to perform HR-BS mode operation. |  |
| } |  |  |  |