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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | ***Additional parameters for multimode HR-MS selection*** |
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| Re: | “IEEE 802.16n-11/0025,” in response to the 802.16n (GRIDMAN) AWD Call for Comments |
| Abstract | This contribution is a proposal related to multimode operation in IEEE 802.16.1a. |
| Purpose | To discuss and adopt the proposed text in the AWD of 802.16n |
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**Additional parameters for multimode HR-MS selection**

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# Introduction

According to IEEE 802.16.1a AWD, a multimode HR-MS may operate as an HR-RS to provide connectivity for multiple out-of-coverage HR-MSs. For this purpose, a superorindate HR-BS may select one among multimode HR-MSs who can act HR-RS by considering their locations as well as their battery levels. (How to select a multimode HR-MS acting as HR-RS is an implementation issue. However, the required parameters for the implementation should be defined at this standard.) One of parameters to estimate the location of the multimode HR-MS is its previous serving BSID.

Upon a serving HR-BS being disabled, the multimode HR-MSs in the disrupted cell shall perform either network reentry or initial network entry to an available HR-BS. During the network reentry, the HR-MS reports its previous serving BSID to the HR-BS by sending an AAI-RNG-REQ message with Ranging Purpose Indication set to the code 0b1000. In case of initial network entry, however, the HR-MS cannot report its previous serving BSID to the HR-BS. This is because there is no consideration on the initial network entry issued by coverage loss in the current standards.

In this contribution, we propose to insert a coverage loss indicator and a previous serving BSID into the AAI-RNG-REQ message field in case Ranging Purpose Indication set to the code 0b0000. If a multimode HR-MS performs initial network entry due to the coverage loss, it shall send to the HR-BS an AAI-RNG-REQ message with its previous serving BSID, with setting coverage loss indicator as 0b1.

# Proposed Texts

Note:

The text in **BLACK** color: the existing text in the 802.16n Amendment Draft Standard

The text in **~~RED~~** color: the removal of existing 802.16n Amendment Draft Standard Text

The text in **BLUE** color: the new text added to the 802.16n Amendment Draft Standard Text

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

**[*Add the following text in new Section 6.2.3.1 in 802.16.1a AWD.*]**

**6.2.3.1 AAI-RNG-REQ**

 ***[Change Table 27 in section 6.2.3.1 as indicated:]***

**Table 27—AAI-RNG-REQ message Field Description**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Size****(bits)** | **Value/Description** | **Condition** |
| Ranging Purpose Indication | 4 | 0b0000 = Initial network entry0b0001 = HO reentry0b0010 = Network reentry from idle mode0b0011 = Idle mode location update 0b0100 = DCR mode extension0b0101 = Emergency call setup (e.g., E911)0b0110 = Location update for updating service flow management encodings of E-MBS flows0b0111 = Location update for transition to DCR mode from idle mode0b1000 = Reentry from DCR mode, coverage loss or detection of different ABS restart count.0b1001 = Network reentry from a Legacy BS0b1010 = Zone switch to MZONE from LZONE0b1011 = Location update due to power down.0b1100 = Interference mitigation request to a CSG Femto ABS when experiencing interference from the CSG Femto ABS0b1101 = NS/EP call setup0b1110 = HR multicast service location update0b1111 = Network reentry for FBIS operation | - |
| If (Ranging Purpose Indication == 0b0000) { |  | // Initial network entry |  |
| If (S-SFH Network Configuration bit == 0b0 and AMSID privacy is enabled) { |  |  |  |
| AMSID\* | 48 | The AMSID hash value. Refer to 16.2.5.3.1 |  |
| } else if (S-SFH Network Configuration bit == 0b1 or AMSID privacy is disabled){ |  |  |  |
| AMS MAC address | 48 | AMS’s real MAC address |  |
| } |  |  |  |
| MAC version | 8 | See 11.1.3 |  |
| Initial Offset for uplink power control (OffsetInitial) | 5 | The bit size represents power level ranging from –15 dB (0x00) to 16dB (0x1F) with 1dB step The value is determined by AMS after successful initial ranging process |  |
| Coverage loss indicator | 1 | 0b0: Initial network entry0b1: Initial network entry by coverage loss |  |
| If (Coverage loss indicator == 0b1) { |  |  |  |
| Serving BSID | 48 | The BSID of the HR-MS’s previous Serving HR-BS before incurring a coverage loss |  |
| } |  |  |  |
| … | … | … | … |
| }else if (Ranging Purpose Indication == 0b1101) { |  | //NS/EP call setup |  |
| AMS MAC address | 48 | AMS’s real MAC address |  |
| MAC version  | 8 | see 11.1.3 |  |
| Initial Offset for uplink power control (OffsetInitial) | 5 | The bit size represents power level ranging from -15dB (0x00) to 16dB(0x1F) with 1dB step. The value is determined by AMS after successful initial ranging process. |  |
| }else if (Ranging Purpose Indication == 0b1110) { |  | // HR multicast location update |  |
| action code | 3 | bit0: multicast service flow updatebit1: location update due to multicast zone changebit2: multicast security key update |  |
| } else if (Ranging Purpose Indication == 0b1111) { |  | // Network reentry for FBIS operation |  |
| If (STID is not preassigned) { |  |  |  |
| Serving BSID | 48 | The BSID of the AMS's previous S-ABS before incurring a coverage loss, or the BSID of the S-ABS to which the AMS is currently connected (has completed the registration cycle and is in Connected State). |  |
| Previous STID | 12 | The STID which the AMS uses in the previous S-ABS. |  |
| } else { |  |  |  |
| STID | 12 | The Station ID pre-assigned by the T-ABS |  |
| } |  |  |  |
| If (CMAC indicator == 0b1){ |  |  |  |
| AK\_COUNT | 16 | The AMS's current value of the AK\_COUNT, which is used to update the security keys in the T-ABS. | Shall be presented if the AMS has a CMAC Tuple necessary to expedite security authentication |
| } |  |  |  |
| Primary Serving ABS flag | 1 | 0b0 : the AMS shall set its primary serving ABS as S-ABS (Degraded HR-BS) after network reentry0b1 : the AMS shall set its primary serving ABS as T-ABS (Target HR-BS) after network reentry |  |
| Switched AccessMode | 1 | 0 : Switched Access with fixed Switched Access Windows1 : Switched Access with variable Switched Access Windows |  |
| If(Switched Access Mode==0 ) { |  |  |  |
| Switched Access Window Size | 8 | The size of fixed Switched Access Window in unit of frame |  |
| } else if ( Switched Access Mode == 1) { |  |  |  |
| Maximum Switched Access Window Size | 8 | Maximum size of Switched Access Window in unit of frame |  |
| } |  |  |  |
| Switched Access Start Time | 8 | The 8 least significant bits of the absolute frame number at the T-ABS where the AMS starts to perform the Switched Access operation. |  |
| } //end of Ranging Purpose Indication |  |  |  |
| … | … | … | … |

[-------------------------------------------------End of Text Proposal----------------------------------------------------]