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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** | |
| Title | **Clarification on MAC control messages for multimode operation in IEEE 802.16.1a** | |
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| Re: | “IEEE 802.16-12-271,” in response to Letter Ballot Recirc #38b on P802.16.1a/D3 | |
| Abstract | This provides AWD text proposals for clarification of message fields for multimode operation 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 MAC control messages for multimode operation in IEEE 802.16.1a**

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# Introduction

In this contribution, we suggest the corrections of typos as well as the modifications of the ambiguous text in message fields for multimode operation over IEEE P802.16.1a/D3.

# 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: Correct the typos or errors in Table 106b in IEEE P802.16.1a/D3.]***

***[Page# 57, Line# 6]***

**6.2.3.65.2 AAI-MM-RS-REQ**

To establish relay link between a multimode station and superordinate HR-BS, AAI-MM-RS-REQ message is transmitted by the multimode station or the superordinate HR-BS.

**Table 106b – AAI-MM-RS-REQ message field description**

| **Field** | **Size (bits)** | **Value/Description** | **Condition** |
| --- | --- | --- | --- |
| Request Relay mode | 1 | 0b0: TTR relay mode  0b1: STR relay mode | Always present |
| If(this request is subordinate station initiated request) { |  |  | Shall be present when subordinate station initiates AAI-MM-RS-~~RSP~~REQ |
| … | … | … | … |

***[Remedy2: Correct the typos or errors in Table 106c in IEEE P802.16.1a/D3.]***

***[Page# 58, Page# 59]***

**6.2.3.65.3 AAI-MM-RS-RSP**

An AAI-MM-RS-RSP message is transmitted by multimode station or superordinate HR-BS in response to AAI-MM-RS-REQ message.

**Table 106c – AAI-MM-RS-RSP message field description**

| **Field** | **Size**  **(bits)** | **Value/Description** | **Condition** |
| --- | --- | --- | --- |
| If(the response is transmitted by superordinate HR-BS) { |  |  | Present when superordinate HR-BS responds the subordinate station initiated request |
| Response code | 2 | 0b00: in response to the AAI-MM-RS-REQ message to accept the request  0b01: in response to the AAI-MM-RS-REQ message to allow to transmit subordinate station initiated ~~AAI-ARE-REQ~~ AAI-MM-RS-REQ after action time expires  0b10: in response to the AAI-MM-RS-REQ message to reject the request  0b11: *reserved* |  |
| If(Response code == 0b00 and the request was sent by an HR-BS ~~wishing to establish TTR relay link~~ to establish TTR relay mode){ |  |  | // Request Relay mode == 0b0 in MM-RS-REQ |
| *Ta* | 11 | Confirmed value of timing advance *Ta* , in units of 0.1 μs |  |
| *Tbs* | 5 | Confirmed duration of the BS Operation mode, in units of frames |  |
| *Trs* | 5 | Confirmed duration of the RS Operation mode, in units of frames |  |
| } |  |  |  |
| If(Response code == 0b01) { |  |  |  |
| Action time | 4 | LSBs of the superframe number when the subordinate station transmits AAI-MM-RS-REQ message. | Always present |
| } |  |  |  |
| } else { |  |  | Present when subordinate station responds to the superordinate HR-BS initiated request |
| If(received request relay mode == 0b0) { |  |  | // TTR mode |
| ST-TTG | 6 | Transmit-to-receive turnaround gap of subordinate station, i.e., HR-MS or HR-BS, in units of μs. It shall be less than 50 μs. | Shall be present if ~~action code~~ request relay mode == 0b0 in AAI-MM-RS-REQ. |
| ST-RTG | 6 | Receive-to-transmit turnaround gap of subordinate station, i.e., HR-MS or HR-BS, in units of μs. It shall be less than 50 μs. | Shall be present if ~~action code~~ request relay mode == 0b0 in AAI-MM-RS-REQ. |
| If (requested subordinate station is HR-BS) { |  |  | Shall be present if the subordinate station is HR-BS and ~~action code~~ request relay mode == 0b0 in AAI-MM-RS-REQ. |
| *Ta* | 11 | Confirmed value of timing advance *Ta* , in units of 0.1 μs |  |
| *Tbs* | 5 | Confirmed duration of the BS Operation mode, in units of frames |  |
| *Trs* | 5 | Confirmed duration of the RS Operation mode, in units of frames |  |
| } |  |  |  |
| … | … | … | … |

***[Remedy3: Correct the typos or errors in Table 130 in IEEE P802.16.1a/D3.]***

***[Page# 52] Note: Our suggestion is for the ‘Superframe Number Action’ field in page 52.***

**6.2.3.57 AAI-ARS-CONFIG-CMD message format**

…

**Table 100 – AAI-ARS-CONFIG-CMD message field description**

| **Field** | **Size**  **(bits)** | **Value/Description** | **Condition** |
| --- | --- | --- | --- |
| … | … | … | … |
| If (subordinate HR-MS is multimode MS acting as HR-RS in HR-Network) { |  |  |  |
|  |  |  |  |
| Superframe Number Action  *[in Page# 52]* | 4 | LSBs of the superframe number when ~~HR-RS start~~ HR-MS starts RS operation and ~~apply~~ applies the PHY operational parameters. | Always present |
| … | … | … | … |

***[Remedy4: Correct the typos or errors in Table 106f in IEEE P802.16.1a/D3.]***

***[Page# 63]***

**6.2.3.65.6 AAI-MM-BS-REQ**

…

**Table 106f – AAI-MM-BS-REQ message field description**

| **Field** | **Size**  **(bits)** | **Value/Description** | **Condition** |
| --- | --- | --- | --- |
| … | … | … | … |
| If (SFH encoding format == 0b00)  { |  |  |  |
| *SFH Subpkt 1* | variable | See Table 182 ~~in IEEE Std 802.16m-2011.~~ |  |
| *SFH Subpkt 2* | variable | See Table 183 ~~in IEEE Std 802.16m-2011.~~ |  |
| *SFH Subpkt 3* | variable | See Table 184 ~~in IEEE Std 802.16m-2011.~~ |  |
| … | … | … | … |

***[Remedy5: Correct the typos or errors in Table 106g in IEEE P802.16.1a/D3.]***

***[Page# 63]***

**6.2.3.65.7 AAI-MM-BS-RSP**

…

**Table 106g – AAI-MM-BS-RSP message field description**

| **Field** | **Size**  **(bits)** | **Value/Description** | **Condition** |
| --- | --- | --- | --- |
| Response code | 2 | This indicates response type of AAI-MM-BS-RSP message.  0b00: Request by multimode HR-MS in Unsolicited manner  0b01: Approval of AAI-MM-BS-REQ  0b10: Rejection of AAI-MM-BS-REQ  0b11: *Reserved* |  |
| If (Response code == 0b10)  { |  |  |  |
| Operation | 2 | 0b00: Retransmit AAI-MM-BS-REQ message (HR-BS mode of multimode HR-MS is not yet completely configured.)  0b01: Retransmit AAI-MM-BS-REQ message after ~~applying the system configuration change count~~ updating the system configuration parameters (System configuration change count of multimode HR-MS is out of date.)  0b10: Cancel BS configuration request  0b11: *Reserved* |  |
| } |  |  |  |