

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Clarification on MAC management messages over IEEE 802.16n	
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Re:	“IEEE 802.16-12-400-00-Gdoc,” in response to Letter Ballot Recirc #37b on P802.16n/D3	
Abstract	Comments on MAC management message in GRIDMAN Draft Standard	
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN	
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Clarification on MAC management messages over IEEE 802.16n

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1. Introduction

This document provides clarification on the MAC management messages over IEEE 802.16n.

2. References

- [1] IEEE 802.16-12-0132-00, GRIDMAN System Requirement Document including SARM annex, January 2012.
- [2] IEEE P802.16nTM/D3, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
- [3] IEEE P802.16.1aTM/D3, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
- [4] IEEE P802.16Rev3/D6, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems," April 2012.
- [5] IEEE P802.16.1TM/D6, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, April 2012.

3. Proposed Text on the IEEE 802.16n Amendment Draft Standard

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

[Remedy1: change Table 680 - MAC management messages, page 5-6 on P802.16n as follows:]

Table 68053 - MAC management messages

Type	Message Name	Message Description	Connection
110-255		Reserved	
FBD110	<u>MM-ADV</u>	<u>Multimode Advertisement message</u>	<u>Broadcast</u>
FBD111	<u>MM-BS-REQ</u>	<u>Multimode Base station Request message</u>	<u>Primary</u>
FBD112	<u>MM-BS-RSP</u>	<u>Multimode Base station Response message</u>	<u>Primary</u>
FBD113	<u>MM-BS-CMD</u>	<u>Multimode Base station Command message</u>	<u>Primary</u>

Table 68053 - MAC management messages

Type	Message Name	Message Description	Connection
FBD114	MM-RS-REQ	Multimode Relay Request message	Primary
FBD115	MM-RS-RSP	Multimode Relay Response message	Primary
FBD116	MM-RL-REQ	Multimode Release Request message	Primary
FBD117	MM-RL-RSP	Multimode Release Response message	Primary
FBD118	MM-STAT-REP	Multimode Status Report message	Primary
FBD	MM-MS-ADV	Multi-mode HR-MS advertisement for switching mode to HR-BS.	
FBD119	DC-LC-REQ	Direct Communication Link Creation Request	Primary
FBD120	DC-LC-RSP	Direct Communication Link Creation Response	Primary
FBD121	DC-LD-REQ	Direct Communication Link Deletion Request	Primary
FBD122	DC-LD-RSP	Direct Communication Link Deletion Response	Primary
FBD123	DC-LR-REQ	Direct Communication Link Report Request	Primary
FBD124	DC-LR-RSP	Direct Communication Link Report Response	Primary
FBD125	NCI	Network Configuration Information (for BS-controlled FTN)	Broadcast by forwarding HR-MS
FBD126	PM-NBR-REQ	Neighboring Alternate Path Request Message	Primary
FBD127	PM-NBR-RSP	Neighboring Alternate Path Response Message	Primary
FBD128	PM-SAC-REQ	Switched Access Control Request Message	Primary
FBD129	PM-SAC-RSP	Switched Access Control Response Message	Primary
FBD130	HR-RNG-CMD	Neighbor discovery command	Broadcast or Primary management
FBD131	HR-RNG-REP	Neighbor discovery report	Primary management
FBD132	FN-CONFIG-CMD	BS-controlled FTN configuration	Primary management
FBD133	FN-RNG-FLU	Forwarding Ranging Follow-up	Primary
FBD134	F-MAP	Forwarding MAP (for BS-controlled FTN)	Broadcast by forwarding HR-MS
FBD135	HR-MG-IND	High Reliable Multicast Group Indication	Broadcast
FBD136	HR-MT-IND	High Reliable Multicast Traffic Indication	Broadcast
FBD137	PI	Paging Indicator	Broadcast
FBD138	MSPG-GRP	MS Paging Group List (to add/delete)	Primary

Table 68053 - MAC management messages

Type	Message Name	Message Description	Connection
TBD 139	MSPG-PG	MS Paging Group Configuration	Multicast
140	HR-PCC	High Reliable Power Control Configuration	Primary
141-255		Reserved	

[Remedy2: change the 3rd row of Table 229a-MM-ADV message format (line #13, page 13) on P802.16n as follows:]

Management Message Type= TBD 110	8	=
---------------------------------------------	---	---

[Remedy3: change the 3rd row of Table 229b-MM-BS-REQ message format (line #25, page 14) on P802.16n as follows:]

Management Message Type= TBD 111	8	=
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[Remedy4: change the 3rd row of Table 229c-MM-BS-RSP message format (line #29, page 16) on P802.16n as follows:]

Management Message Type= TBD 112	8	=
---------------------------------------------	---	---

[Remedy5: change the 3rd row of Table 229d-MM-BS-CMD message format (line #15, page 17) on P802.16n as follows:]

Management Message Type= TBD 113	8	=
---------------------------------------------	---	---

[Remedy6: change the 3rd row of Table 229e-MM-RS-REQ message format (line #8, page 18) on P802.16n as follows:]

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4 Management Message Type=~~TBD~~114

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10 **[Remedy7: change the 3rd row of Table 229f-MM-RS-RSP message format (line #9,**
11 **page 19) on P802.16n as follows:]**
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15 Management Message Type=~~TBD~~115

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21 **[Remedy8: change the 3rd row of Table 229g-MM-RL-REQ message format (line #21,**
22 **page 20) on P802.16n as follows:]**
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26 Management Message Type=~~TBD~~116

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33 **[Remedy9: change the 3rd row of Table 229h-MM-RL-RSP message format (line #11,**
34 **page 21) on P802.16n as follows:]**
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38 Management Message Type=~~TBD~~117

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44 **[Remedy10: delete whole section 6.3.2.3.99.9 MM-MS-ADV message (line#8, page 22 to**
45 **line5, page 23, on P802.16n.)**
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48
49 **[Remedy11: change the 3rd row of Table 229j-MM-STAT-REP message format (line**
50 **#12, page 23) on P802.16n as follows:]**
51

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54 Management Message Type=~~TBD~~118

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60 **[Remedy12: change line#15 - #19, page 23 on P802.16n as follows:]**
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63
64 **6.3.2.3.99.11 DC-LC-REO message**
65

When HR-BS creates direct communication link between two HR-MSs. It shall allocate a CID for the direct communication link and send link creation message to both source and destination HR-MSs. Direct communication link creation can only be initiated by the HR-BS.

A DC-LC-REQ message is transmitted by an HR-BS to allocate a CID for the direct communication link between two HR-MSs during creating direct communication link between those two HR-MSs.

Table 229k - ~~Direct Communication Link Creation Request~~DC-LC-REQ message format

Syntax	Size (bit)	Notes
DC-LC-REQ_Message_Format () {	=	=
Management Message Type= [TBD] 119	8	=

[Remedy13: change line#9 - #11, page 24 on P802.16n as follows:]

6.3.2.3.99.12 DC-LC-RSP message

The HR-MSs shall send back a response once they receive the direct communication link creation request. A DC-LC-RSP message is transmitted by an HR-MS in response to DC-LC-REQ message.

Table 229l - ~~Direct Communication Link Creation Response~~DC-LC-RSP message format

Syntax	Size (bit)	Notes
DC-LC-RSP_Message_Format () {	=	=
Management Message Type= [TBD] 120	8	=

[Remedy14: change line#14 - #18, page 24 on P802.16n as follows:]

6.3.2.3.99.13 DC-LD-REQ message

The HR-BS may transmit this message to both HR-MS of a direct communication link to initiate the removal of that link. See 16.2.2.1.2.1.2 for further details on the procedure for the removal of a direct communications link. A DC-LD-REQ message is transmitted by an HR-BS to both HR-MSs of a direct communication link to request those HR-MSs to remove the direct communication link.

Table 229m - ~~Direct Communication Deletion Request~~DC-LD-REQ message format

Syntax	Size (bit)	Notes
DC-LD-REQ_Message_Format () {	=	=
Management Message Type= [TBD] 121	8	=

[Remedy15: change line#20, page24 - line#1, page25 on P802.16n as follows:]

6.3.2.3.99.14 DC-LD-RSP message

The HR-MS shall reply with reasons to HR-BS when it receives the link deletion request from HR-BS. A DC-LD-RSP message is transmitted by an HR-MS in response to DC-LD-REQ message.

Table 229m - ~~Direct Communication Deletion Response~~DC-LD-RSP message format

Syntax	Size (bit)	Notes
DC-LD- ACK RSP_Message_Format () {	=	=
Management Message Type= [TBD] 122	8	=

[Remedy16: change line#4-line#7, page25 on P802.16n as follows:]

6.3.2.3.99.15 DC-LR-REQ message

HR-BS may require the HR-MS report the status of the direct communication link by sending a ~~request~~ DC-LR-REQ message to the relative HR-MS.

Table 229o - ~~Direct Communication Link Report Request~~DC-LR-REQ message format

Syntax	Size (bit)	Notes
DC-LR-REQ_Message_Format () {	=	=

Table 229o - ~~Direct Communication Link Report Request~~ DC-LR-REQ message format

Syntax	Size (bit)	Notes
Management Message Type= [TBD] 123	8	=

[Remedy17: change line#10-line#13, page25 on P802.16n as follows:]

6.3.2.3.99.16 DC-LR-RSP message

HR-MS shall send back a DC-LR-REQ message to report regarding the direct communication link ~~when it receives a link report request from HR-BS~~ in response to DC-LR-REQ message.

Table 229o - ~~Direct Communication Link Report~~ DC-LR-REP message format

Syntax	Size (bit)	Notes
DC-LR-REP_Message_Format () {	=	=
Management Message Type= [TBD] 124	8	=

[Remedy18: change the 3rd row of Table 229q-NCI message format (line #1, page 26) on P802.16n as follows:]

Management Message Type= [TBD] 125	8	=
-----------------------------------------------	---	---

[Remedy19: change line#3-line54, page27 on P802.16n as follows:]

6.3.2.3.99.18 PM-NBR-REQ message

HR-MS shall send back a PM-NBR-REQ message to report regarding the direct communication link ~~when it receives a link report request from HR-BS~~ in response to DC-LR-REQ message.

Table 229r - PM-NBR-REQ message field and description

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
PM-NBR-REQ_Message_Format () {	=	=
<u>Management Message Type=126</u>	<u>8</u>	=
<u>Mode requested</u>	<u>2</u>	<u>0b00: Normal neighbor discovery</u> <u>0b01: Discovery to prepare for BS determine alternative path</u> <u>0b10: Discovery to prepare for MS determine alternative path, HR-BS shall reply HR-MS in the message PM-NBR-REP.</u> <u>0b11: Inform HR-BS of the forwarding HR-MS chosen for alternative path</u>
<u>If (Mode requested == 0b11) {</u>		
<u>Index of the forwarding HR-MS</u> <u>±</u>	<u>4</u>	<u>The index of HR-MS chosen as the forwarding HR-MS as in the PM-NBR-REP message when Mode is 0b11</u>
<u>Reserved</u>	<u>2</u>	
<u>}</u>		
<u>else {</u>		
<u>Reserved</u>	<u>6</u>	
<u>}</u>		
<u>}</u>		

[Remedy20: change the 2nd-3rd row of Table 229s-PM-NBR-REP message format (line #8, page 27) on P802.16n as follows:]

PM-NBR-REP_Message_Format(){		
Management Message Type= 126 127	8	=

[Remedy21: change line#3-line5, page28 on P802.16n as follows:]

6.3.2.3.99.20 PM-SAC-REQ message

Table 229t - PM-SAC-REQ message field and description

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
PM-SAC-REQ Message Format () {	=	=
Management Message Type=128	8	=
SAC sub-type	2	0b00: Access Request 0b01: Termination Request 0b10-0b11: reserved
If (SAC sub-type == 0b00) {		
Requested Switched Access Window Size	7	Requested access time in frames
Reserved	7	
} else if (SAC sub-type == 0b01) {		
Termination reason	2	0b00: Backbone recovery 0b01: No connection for FBIS 0b10: Link failures 0b11: reserved
Reserved	4	
}		
}		

[Remedy22: change line#6-line8, page28 on P802.16n as follows:]

6.3.2.3.99.21 PM-SAC-RSP message

Table 229u - PM-SAC-RSP message field and description

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
PM-SAC-RSP_Message_Format () {	=	=
<u>Management Message Type=129</u>	<u>8</u>	=
SAC sub-type	<u>2</u>	<u>0b00: Access Request</u> <u>0b01: Termination Request</u> <u>0b10-0b11: reserved</u>
If (SAC sub-type == 0b00) {		
<u>Status</u>	<u>1</u>	<u>0b0 : Switched access granted, allocates</u> <u>Switched Access Window</u> <u>0b1 : Switched access not granted,</u> <u>Switched Access Window not allocated</u>
If (Statue == 0b0) {		
<u>Switched Access Window</u>	<u>7</u>	<u>LSB of frame sequence.</u> <u>Indicates the frame that Switched Access</u> <u>Window ended</u>
<u>Reserved</u>	<u>6</u>	
} else {		
<u>Reserved</u>	<u>5</u>	
}		
} else if (SAC sub-type == 0b01) {		
<u>Status</u>	<u>1</u>	<u>0b00: Backbone recovery</u> <u>0b01: No connection for FBIS</u> <u>0b10: Link failures</u> <u>0b11: reserved</u>
<u>Reserved</u>	<u>5</u>	
}		
}		

[Remedy23: change the 3rd row of Table 229v-HR-RNG-CMD message format (line #4, page 29) on P802.16n as follows:]

Management Message Type= [TBD] 130	8	=
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[Remedy24: change the 3rd row of Table 229w-HR-RNG-REP message format (line #1, page 31) on P802.16n as follows:]

Management Message Type= [TBD] 131	8	=
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[Remedy25: change the 3rd row of Table 229x-FN-CONFIG-CMD message format (line #8, page 31) on P802.16n as follows:]

Management Message Type= [TBD] 132	8	=
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Remedy26: change line#2-line#5, page33 on P802.16n as follows:]

6.3.2.3.99.25 FN-RNG-FLU (Forwarding Ranging Follow-up) message

ServingAn HR-BS/RS transmits FN-RNG-FLU [message](#) to instruct an HR-MS to follow-up with the ranging process of a new HR-MS, as part of the coverage extension process.

Table 229y - FN-RNG-FLU message format

Syntax	Size (bit)	Notes
HR-RNG-REP_Message_Format () {	=	=
FN-RNG_RLU_Message_Format () {		
Management Message Type= [TBD] 133	8	=

[Remedy27: change the 3rd row of Table 229z-F-MAP message format (line #11, page 33) on P802.16n as follows:]

Management Message Type= FBD 134	8	=
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[Remedy28: change the 3rd row of Table 229ee-HR-MG-IND message format (line #1, page 36) on P802.16n as follows:]

Management Message Type= xx 135	8	=
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[Remedy29: change the 3rd row of Table 229ff-HR-MT-IND message format (line #6, page 37) on P802.16n as follows:]

Management Message Type= xx +136	8	=
---------------------------------------------	---	---

[Remedy30: add new row in Table 229gg-PI message format (line #6, page 39) on P802.16n as follows:]

PI_message_format () {		
Management Message Type=137	8	=
N_PI	6	Indicates the number of distinct paging indications

Remedy31: change section 6.3.2.3.99.30 (line#9-line#13, page39) on P802.16n as follows:]

6.3.2.3.99.30 MSPG-GRP message

~~To add or remove an HR-MS to or from a pagers group the HR-BS shall unicast an MSPG-GRP described in Table 229hh:~~

To add or remove an HR-MS to or from a pagers group the HR-BS transmits an MSPG-GRP message.

Table 229hh - MSPG-GRP message format

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
MSPG-GRP_Message_Format () {	=	=
Management Message Type=138	<u>8</u>	=
<u>Purpose</u>	<u>1</u>	0b - remove from group. 1b - add to group 0b0 - remove from group 0b1 - add to group
<u>Pager group ID</u>	<u>8</u>	
<u>Padding bits</u>	<u>variable</u>	<u>As required for octet boundary</u>
}		

Remedy32: change section 6.3.2.3.99.31 (line#1-line#5, page40) on P802.16n as follows:]

6.3.2.3.99.31 MSPG-PG message

~~MSPG-PG multicast to a group of paging HR-MS lists of paged HR-MS ID and the access resources to be used by them. The format is defined in Table 229ii.~~

[To control the paging operation of the group of paging HR-MSs accessing resources used by them, MSPG-PG message is transmitted by an HR-BS.](#)

Table 229ii - MSPG-PG message format

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
MSPG-PG_message_format () {	=	=
Management Message Type=139	<u>8</u>	=
<u>N_PI</u>	<u>6</u>	<u>Indicates the number of distinct paging indicators</u>
<u>Sub-channel offset for ranging</u>	<u>5</u>	<u>Counted from the beginning of FCZ assigned for transmissions by forwarded HR-MS</u>

Table 229ii - MSPG-PG message format

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
<u>Ranging method</u>	<u>1</u>	<u>0b0: Initial ranging over two symbols</u> <u>0b1: BR/periodic ranging over one symbol</u>
<u>For (i=0; i<N_PI; i++) {</u>		
<u>PI PID</u>	<u>12</u>	
<u>Initial ranging code</u>	<u>5</u>	<u>CDMA codes used for initial ranging as-</u> <u>in table {PIM}</u>
<u>}</u>		
<u>Padding bits</u>	<u>variable</u>	<u>As required for octet boundary</u>
<u>TLV encodings for MSPG-PG</u>	<u>variable</u>	<u>TLV-specific</u>
<u>}</u>		

Remedy33: change section 6.3.2.3.99.32 (line#7-line#9, page40) on P802.16n as follows:]

6.3.2.3.99.32 HR-PCC Message

Table 229jj - HR-PCC message format

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
<u>HR-PCC_message_format () {</u>	<u>=</u>	<u>=</u>
<u>Management Message Type=140</u>	<u>8</u>	<u>=</u>
<u>IOT_C</u>	<u>7</u>	<u>IoT value for control channels, quantized in 0.5 dB steps as IoT level from 0 dB to 63.5 dB</u>
<u>Offset_C</u>	<u>6</u>	<u>Offset value for control channels, represents the value among -15.5 to 16 dB with 0.5 dB step</u>
<u>IOT_D</u>	<u>7</u>	<u>IoT value for data channels, quantized in 0.5 dB steps as IoT level from 0dB to 63.5 dB</u>

Table 229jj - HR-PCC message format

<u>Syntax</u>	<u>Size (bit)</u>	<u>Notes</u>
<u>Offset_D</u>	<u>6</u>	Offset value for data channels, represents the value among -15.5 to 16 dB with 0.5 dB step
<u>Reserved</u>	<u>6</u>	
}		

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

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