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Title	**Corrections to MBS in 802.16REV2**	
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Re:	P802.16Rev2/D4, LB26C (in support of comment 3149)	
Abstract	MBS definitions and procedures in the REV2 D4 draft needs some correction.	
Purpose	Adoption toward REV2/D4	
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Correction to MBS in 802.16REV2

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Introduction

Rev2D4 removed to requirement for a separate permutation zone. The purpose of this removal was to enable a flexible scheduling of MBS bursts such they are not part of dedicated permutation zone for MBS. However the PHY initialization of the PRBS generator (see 8.3.3.4.2) mandates the knowledge of the relative position within the permutation zone.

As a result the MBS daisy chain mechanism is broken as there is no longer a requirement to transmit a separate permutation zone and the MS must (also for IDLE):

1. First decode the DL MAP
2. Identify all permutation zones described in the DL MAP.
3. Calculate the burst relative position within the relevant permutation zone.

Only than it can perform demodulation of the MBS burst.

This effectively diminishes the benefit of daisy chain:

Reduces the probability of correct MBS burst decoding (as the correct decoding is now dependent on 2 consecutive DL MAPs in addition to the correct decoding of the MBS MAP and the PDU in the burst).

Since Macro-diversity only mandates the transmission of DL MAP in some of the bursts this problem pertains to both Macro-diversity and non Macro-diversity MBS zones.

Proposed Solution

- Return the requirement of a separate permutation zone for MBS zone (MBS zones may share a single permutation zone) – return to the previous state of Rev2D3.
- Correct the MBS MAP IE which is broken for the non macro diversity case such it supports the daisy chain.

Proposed Text Modification

[In 6.3.2.3.52, modify the text:]

6.3.2.3.52 MBS_MAP (multicast and broadcast service map) message

The BS shall send an MBS_MAP message on the Broadcast CID to specify the location and size of multi-BS MBS data bursts which are located in DL permutation zones designated for MBS in frames that are from 2 to 5 frames in the future from the frame containing the MBS MAP message. If present, an MBS_MAP message shall be located at the first symbol and the first subchannel in the DL permutation zone for MBS. The MBS_MAP message format is presented in Table 153. This message includes the MBS_DATA_IE, Extended_MBS_DATA_IE and MBS_DATA_Time_Diversity_IE which define the access information for the MBS burst. See Tables 154, 155, 156 and 157.

[Insert text after table 154:]

The MBS DL permutation zone start position of the next MBS MAP shall be indicated on MBS MAP via the Next MBS OFDMA Symbol Offset parameter which identifies the MBS permutation Zone If the MBS MAP was not transmitted in an instance of the permutation zone designated for MBS the starting point of this permutation zone shall be identical to the previous instance of the permutation zone designated for MBS in which the relevant MBS MAP was transmitted. This is needed as some of the instances of the DL permutation zone for MBS do not include MBS MAP. However for the MBS daisy chain operation to work a MS in IDLE needs to know the starting position of the DL permutation zone and its associated parameters without reading the DL MAP. Therefore
The permutation type, DL_PermBase and PRBS_ID of the MBS permutation zone shall not change.

[Modify table 335:]

Syntax	Size (bit)	Notes
MBS_MAP_IE() {	-	-
Extended-2 DIUC	4	MBS MAP IE = 0x00
Length	8	-
MBS Zone identifier	7	MBS Zone identifier corresponds to the identifier provided by the BS at connection initiation
Macro diversity enhanced	1	0: Non Macro-Diversity enhanced zone; 1: Macro-Diversity enhanced zone
~~If(Macro diversity enhanced Multi BS MBS = 1){~~	-	-
Permutation	2	0b00: PUSC permutation 0b01: FUSC permutation 0b10: Optional FUSC permutation 0b11: Adjacent subcarrier permutation
DL_PermBase	5	-
PRBS_ID	2	-
OFDMA Symbol Offset	7	The offset of the OFDMA symbol measured in OFDMA symbols from beginning of the DL frame in which the DL-MAP is transmitted. Counting from the frame preamble and starting from 0
MBS MAP message allocation included indication	1	Used to indicate if the MBS MAP message allocation parameters are included
Reserved	3	Shall be set to zero

if (MBS MAP message allocation included = 1) {	-	-
Reserved	3	-
Boosting	3	Refer to Table 319
DIUC	4	-
No. Subchannels	6	Indication of burst size of MBS MAP message with the number of subchannels
NO. OFDMA symbols	6	Indication of burst size of MBS MAP message with the number of OFDMA symbols
Repetition Coding Indication	2	0b00—No repetition coding 0b01—Repetition coding of 2 used 0b10—Repetition coding of 4 used 0b11—Repetition coding of 6 used
~~}~~	~~-~~	~~-~~
~~} else {~~	~~-~~	~~-~~
~~DIUC~~	~~4~~	~~-~~
~~CID~~	~~16~~	~~CID for single BS MBS~~
~~OFDMA Symbol Offset~~	~~8~~	~~The offset of the first OFDMA symbol of the MBS region measured in OFDMA symbols from beginning of this DL frame.~~
~~Subchannel offset~~	~~6~~	~~The lowest index OFDMA subchannel used for carrying the burst, starting from subchannel 0.~~
~~Boosting~~	~~3~~	~~Refer to Table 319~~
~~SLC_3_indication~~	~~1~~	~~Used to notify sleep mode class 3 is used for single BS MBS service~~
~~NO. OFDMA Symbols~~	~~6~~	~~-~~
~~NO. Subchannels~~	~~6~~	~~-~~
~~Repetition Coding Indication~~	~~2~~	~~0b00—No repetition coding 0b01—Repetition coding of 2 used 0b10—Repetition coding of 4 used 0b11—Repetition coding of 6 used~~
~~if (SLC 3_indication = 1) {~~	~~-~~	~~-~~
~~Next MBS_MAP_IE Frame Offset~~	~~8~~	~~The Next MBS_MAP_IE Frame Offset value is lower 8 bits of the frame number in which the BS shall transmit the next MBS MAP IE frame.~~
~~}~~	~~-~~	~~-~~
~~}~~	~~-~~	
if !(byte boundary) {	-	-
Padding Nibble	Variable	Padding to reach byte boundary
}	-	-
}	-	-

The burst carrying MBS MAP message shall be located at the first subchannel and first OFDMA symbol of the DL permutation zone designated for the MBS Zone ~~region~~ that is specified by the MBS MAP IE ~~when 'Macro diversity enhanced' is set to 1~~. This ~~MBS region~~ burst shall be located in the same frame as the MBS MAP IE that specifies it. The location of this DL permutation zone designated for the MBS zone ~~region~~ within the frame is specified by 'OFDMA Symbol Offset' in MBS MAP IE. The parameters of the DL permutation zone designated for MBS shall only be changed such that the daisy chain mechanism continues uninterrupted.

[In 11.13.23, modify the text:]

11.13.23 MBS service TLV

This TLV indicates whether the MBS service is being requested or provided for the connection that is being setup. A value of 1 indicates that an MBS sesrvice limited to the serving BS is being requested and a value of 2 indicates multi-BS-MBS is being requested (either with or without Macro-diversity). If MS or BS wants to initiate MBS service, DSA-REQ with MBS service TLV shall be used. The DSA-RSP message shall contain the acceptance or rejection of request and if there is no available MBS, MBS service value shall be set to 0.

Type	Length	Value	Scope
[145/146].4	1	0: No available MBS 1: MBS in Serving BS Only 2: MBS in a multi-BS Zone	DSA-REQ DSA-RSP DSA-ACK

Introduction

[1] Clarifications and Improvement in the MBS definitions and procedures in 802.16REV2, (IEEE C802.16maint-08/064r8, 2008-03-20).