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Title	<b>Changes to the DL Basic Assignment A-MAP IE in IEEE P802.16m/D2 (15.3.6.5.2.2)</b>	
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Re:	Comments on IEEE P802.16m/D2 for IEEE 802.16 Working Group Letter Ballot Recirc #30a	
Abstract	The contribution proposes text changes IEEE P802.16m/D2 in Section 15.3.6.5.2.2 (DL Basic Assignment A-MAP IE)	
Purpose	To be discussed and adopted by the IEEE 802.16 Working Group	
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## Changes to the DL Basic Assignment A-MAP IE in IEEE P802.16m/D2 (15.3.6.5.2.2)

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### Introduction

Editorial simplifications are proposed for the MIMO signaling in the DL basic assignment A-MAP IE. Additionally, the parameter Pilot\_Pattern\_Indicator is introduced to signal the usage of the single-BS MIMO pilot pattern or the usage of the multi-BS MIMO pilot pattern. In case of multi-BS transmissions with CL-MD or Co-MIMO, the pilot transmissions from several cooperating ABSs to the same AMS should combine in the RF domain, so interlaced pilots cannot be used. In this case Pilot\_Pattern\_Indicator indicates that the first interlace of the single-BS MIMO pilot pattern should be assumed for channel estimation at the AMS.

### Instructions to Editor

< Adopt the text changes described below starting on page 358 line 48 >

Begin proposed text with markup

### 15.3.6.5.2.2. DL basic assignment A-MAP IE

Table 801 describes the fields in a DL Basic Assignment A-MAP IE used for resource assignment in the DL.

Definitions of the fields in the DL Basic Assignment A-MAP IE are listed following Table 801.

**Table 801 - DL basic assignment A-MAP IE\***

Syntax	Size in bits	Description/Notes
<del>DL_MAP_IEDL Basic Assignment A-MAP IE</del> () {	-	-
A-MAP IE Type	4	DL Basic Assignment A-MAP IE
I <sub>sizeOffset</sub>	5	Offset used to compute burst size index
MEF	2	MIMO encoder format 0b00: SFBC 0b01: Vertical encoding 0b10: Horizontal encoding 0b11: CDR
if (MEF == 0b01){		Parameters for vertical encoding
<del>if(Nt == 2){</del>		
<del>Mt</del>	1	<del>Number of streams in transmission for Nt = 2</del>

		$(M_t \leq N_t)$ 0b0: 1 stream 0b1: 2 streams
<del>}else if(Nt == 4){</del>		
<del>—— Mt</del>	<del>2</del>	Number of streams in transmission for <del>Nt = 4</del> $(M_t \leq N_t)$ 0b00: 1 stream 0b01: 2 streams 0b10: 3 streams 0b11: 4 streams
<del>}else if(Nt == 8){</del>		
Mt	3	Number of streams in transmission <del>for Nt = 8</del> ( $M_t \leq N_t$ ) <u><math>N_t</math>: Number of transmit antennas at the ABS.</u> 0b000: 1 stream 0b001: 2 streams 0b010: 3 streams 0b011: 4 streams 0b100: 5 streams 0b101: 6 streams 0b110: 7 streams 0b111: 8 streams
<u>Reserved</u>	<u>2</u>	<u>Reserved bits</u>
} else if(MEF == 0b10){		Parameters for horizontal encoding
<del>—— If(Nt == 2){</del>		
<del>—— PSI</del>	<del>1</del>	<del>Allocated pilot stream index for Nt = 2</del> 0b0: #1 stream 0b1: #2 stream
<del>—— Mp</del>	<del>2</del>	<del>Modulation constellation of the paired user</del> 0b00: QPSK 0b01: 16 QAM 0b10: 64 QAM 0b11: <del>other modulation information not available.</del>
<del>—— } else {</del>		
Si	4	Index used <del>when Nt = 4 or 8</del> , to identify the combination of the number of streams and the allocated pilot stream index in a transmission with MU-MIMO, and the modulation constellation of paired user in the case of 2 stream transmission 0b0000: 2 streams with PSI=stream1 and other modulation =QPSK 0b0001: 2 streams with PSI=stream1 and other modulation =16QAM 0b0010: 2 streams with PSI=stream1 and other modulation =64QAM 0b0011: 2 streams with PSI=stream1 and other modulation information not available 0b0100: 2 streams with PSI=stream2 and other modulation =QPSK

		<p>0b0101: 2 streams with PSI=stream2 and other modulation =16QAM                  0b0110: 2 streams with PSI=stream2 and other modulation =64QAM                  0b0111: 2 streams with PSI=stream2 and other modulation information not available                  0b1000: 3 streams with PSI=stream1                  0b1001: 3 streams with PSI=stream2                  0b1010: 3 streams with PSI=stream3                  0b1011: 4 streams with PSI=stream1                  0b1100: 4 stream with PSI=stream2                  0b1101: 4 streams with PSI=stream3                  0b1110: 4 streams with PSI=stream4                  0b1111: n/a</p>
<u>Pilot Pattern Indicator</u>	<u>1</u>	<p><u>Pilot pattern indication</u>  <u>0b0: pilot pattern for single-BS MIMO</u>  <u>0b1: pilot pattern for multi-BS MIMO with Co-MIMO</u></p>
<del>→</del>		
}		
Resource Index	11	<p>5 MHz: 0 in first 2 MSB bits + 9 bits for resource index                  10 MHz: 11 bits for resource index                  20 MHz: 11 bits for resource index</p> <p>Resource index includes location and allocation size</p>
Long TTI Indicator	1	<p>Indicates number of subframes spanned by the allocated resource.                  0b0: 1 subframe (default)                  0b1: 4 DL subframes for FDD or all DL subframes for TDD</p>
HFA	<del>{4}</del> <u>3</u>	<p><del>TBD</del>                  HARQ Feedback Allocation</p>
AI_SN	1	HARQ identifier sequence number
ACID	4	HARQ channel identifier
<del>SPID/CoRe Version</del>	<del>{3}</del>	<del>HARQ subpacket identifier for IR and Constellation Rearrangement version-</del>
<u>SPID</u>	<u>2</u>	<p><u>HARQ subpacket identifier for IR</u></p> <p><u>0b00: 0</u>  <u>0b01: 1</u>  <u>0b10: 2</u>  <u>0b11: 3</u></p>
<u>CRV</u>	<u>1</u>	<p><u>Constellation Rearrangement Version</u></p> <p><u>0b0: 0</u>  <u>0b1: 1</u></p>
Reserved	<del>TBD</del> <u>1</u>	Reserved bits
<del>Padding</del>	<del>Variable</del>	<del>Padding to reach byte boundary</del>
}	-	-

\*A 16 bit CRC is generated based on the contents of the DL Basic Assignment A-MAP IE. The CRC is masked by the Station ID.

**A-MAP IE Type:** Defines the structure of the A-MAP IE for the bits in the A-MAP IE following the A-MAP IE type field. A-MAP IE Type distinguishes between IEs used for the UL/DL, and IEs used for resource allocation and control signaling, ~~basic/extended IEs~~. Additional IE types are reserved for future use.

**MEF:** MIMO Encoder Format

**PSI:** Allocated pilot stream index for horizontal encoding

**$M_t$ :** Number of streams in transmission. The DL pilot pattern with  $M_t$  streams shall be used in the allocated resource.

~~**$M_p$ :** Modulation constellation of the paired user for 2 stream MU-MIMO operation with  $N_t=2$~~

**Si:** Index used when  $N_t=2, 4$  or  $8$ , to identify the combination of the number of streams and the allocated pilot stream index in a transmission with MU-MIMO, and the modulation constellation of paired user in the case of 2 stream transmission

**Pilot Pattern Indicator:** Indicator to signal the usage of the single-BS MIMO pilot pattern or the multi-BS MIMO pilot pattern. The multi-BS MIMO pilot pattern for Co-MIMO corresponds to the first interlace of the single-BS MIMO pilot pattern. In case of CL-MD transmission, the interlace of the single-BS MIMO pilot pattern of the serving ABS shall be used by cooperating ABSs.

~~**RA:** Resource Allocation information is used to signal the type of resource unit allocated (DRU/CRU), the location (start/end) and allocation size.~~

**Resource Index:** Resource Index with starting LRU index and size of a single allocation spanning contiguous LRUs.

**Long TTI Indication:** Indicator to signal allocations span multiple subframes in time.

**HFA:** ~~TBD a~~ Allocation for HARQ feedback.

~~**SPID/CoRe Version:** Signaling for HARQ IR including HARQ subpacket identifier for IR and Constellation Rearrangement version.~~

**SPID:** HARQ subpacket identifier for HARQ IR.

**CRV:** Constellation Rearrangement Version.

~~**RI:** Resource Index with location and size of one instance of a resource allocation.~~

End proposed text with markup