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Title	**Corrections for MIMO MAP IE**	
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Re:	IEEE Std 802.16e-2005
Abstract	The contribution corrects the missing repetition coding indication in several MIMO MAP IEs.
Purpose	Adoption of proposed changes into IEEE Std 802.16e-2005
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Corrections for MIMO MAP IEs

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Introduction

Repetition coding indication is included in some MIMO burst definition IEs. However it is missing in MIMO_DL_Basic_IE (Section 8.4.5.3.8), MIMO_DL_Enhanced_IE (Section 8.4.5.3.9), MIMO_UL_Basic_IE (Section 8.4.5.4.11), MIMO_DL_Enhanced_IE ((Section 8.4.5.4.20), MIMO_in_another_BS_IE () (Section 8.4.5.3.17) and Macro_MIMO_DL_Basic_IE() (Section Section 8.4.5.3.18). This is inconsistent with the support provided by all other burst allocation MAP IEs. The repetition coding is needed in order for BS to communicate with MSs with low SNR.

For MIMO_in_another_BS_IE () and Macro_MIMO_DL_Basic_IE(), we also updated the resource allocation region to reflect the proper bits used for AMC permutation to be consistent with all the other MIMO IEs.

Proposed changes

Modify the following Tables as highlighted in red.

Table 283—MIMO DL basic IE format

Syntax	Size	Notes
MIMO_DL_Basic_IE () {		
Extended DIUC	4 bits	MIMO = 0x05
Length	4 bits	~~Length of the message in bytes (variable)~~
Num_Region	4 bits	
For (i = 0; i< Num_Region; i++) {		
OFDMA Symbol offset	~~10~~8 bits	
If (Permutation = 0b11 and (AMC type is 2x3 or 1x6)) {		
Subchannel offset	8 bits	
Boosting	3 bits	
No. OFDMA Symbols	5 bits	
No. subchannels	6 bits	
Else (		
Subchannel offset	~~5~~6 bits	
Boosting	3 bits	
No. OFDMA Symbols	~~9~~7 bits	
No. Subchannels	~~5~~6 bits	
}		
Matrix_indicator	2 bits	~~STC matrix (see 8.4.8)~~ ~~STC = STC mode indicated in the latest STC_DL_Zone_IE().~~ ~~if (STC == 0b01)~~ ~~{~~ ~~00 = Matrix A~~ ~~01 = Matrix B~~ ~~10 -11 = Reserved~~ ~~}~~ ~~else if (STC == 0b10)~~ ~~{~~ ~~00 = Matrix A~~ ~~01 = Matrix B~~ ~~10 = Matrix C~~ ~~11 = Reserved~~ ~~}~~ STC matrix (see 8.4.8.1.4) if (STC == 0b01 or STC == 0b10) ~~{~~ 0b00 = Matrix A

		0b01 = Matrix B
		0b10 = Matrix C
		0b11 = *Reserved*
		}
		else if (STC == 0b11)
		{
		0b00 = Matrix A
		0b01 = Matrix B
		0b10-11 = Reserved
		}
		elseif (Transmit_Diversity = 10)
		{
		00 = Matrix A
		01 = Matrix B
		10 = Matrix C
		11 = Reserved
		}

Num_layer	2 bits	
Reserved	2~~+~~ bit	Shall be set to zero
for (j = 0; j<Num_layer; j++){		
if (INC_CID == 1) {		
CID	16 bits	
}		
Layer_index	2 bits	
DIUC	4 bits	
Repetition coding indication	2 bits	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
padding	*variable*	Number of bits required to align to byte length, shall be set to zero.
}		

Table 284—MIMO DL enhanced IE format

Syntax	Size	Notes
MIMO_DL_Enhanced_IE () {		
Extended DIUC	4 bits	EN_MIMO = 0x06
Length	4 bits	~~Length of the message in bytes (variable)~~
Num_Region	4 bits	
For (i = 0; i< Num_Region; i++) {		
OFDMA Symbol offset	~~10~~8 bits	

If (Permutation = 0b11 and (AMC type is 2x3 or 1x6)) {		
Subchannel offset	8 bits	
Boosting	3 bits	
No. OFDMA Symbols	5 bits	
No. subchannels	6 bits	
Else (		
Subchannel offset	~~5~~6 bits	
Boosting	3 bits	
No. OFDMA Symbols	~~9~~7 bits	
No. subchannels	~~5~~6 bits	
}		
Matrix_indicator	2 bits	~~STC matrix (see 8.4.8)~~ ~~STC = STC mode indicated in the latest STC_DL_Zone_IE().~~ ~~if (STC == 0b01)~~ ~~{~~ ~~00 = Matrix A~~ ~~01 = Matrix B~~ ~~10 -11 = Reserved~~ ~~}~~ ~~else if (STC == 0b10)~~ ~~{~~ ~~00 = Matrix A~~ ~~01 = Matrix B~~ ~~10 = Matrix C~~ ~~11 = Reserved~~ ~~}~~ STC matrix (see 8.4.8.1.4) if (STC == 0b01 or STC == 0b10) ~~{~~ 0b00 = Matrix A 0b01 = Matrix B 0b10 = Matrix C 0b11 = *Reserved* ~~}~~ else if (STC == 0b11) ~~{~~ 0b00 = Matrix A 0b01 = Matrix B 0b10-11 = Reserved

		}
		elseif (Transmit_Diversity = 10)
		{
		00 = Matrix A
		01 = Matrix B
		10 = Matrix C
		11 = Reserved
		}

Num_layer	2 bits	
Reserved	2~~+~~ bit	Shall be set to zero
for (j = 0; j< Num_layer; j++){		
if (INC_CID == 1) {		
CQICH_ID	*variable*	Index to uniquely identify the CQICH resource assigned to the SS The size of this field is dependent on system parameter defined in DCD.
}		
Layer_index	2 bits	
DIUC	4 bits	
Repetition coding indication	2 bits	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
Padding	*variable*	Number of bits required to align to byte length, shall be set to zero.
}		

Table 299—MIMO UL basic IE format

Syntax	Size	Notes
MIMO_UL_Basic_IE (){		
Extended ~~D~~UIUC	4 bits	MIMO = 0x0~~2~~6
Length	4 bits	~~Length of the message in bytes~~ (variable)
Num_Assign	4 bits	Number of burst assignment
For (j = 0; j< Num_assign; j++) {		
Collaborative_SM_Indication	1 bits	0: Non collaborative SM (Vertical coding assignment to a MIMO capable SS) 1: Collaborative SM (assignment to 2 collaborative SM capable SSs)
If (Collaborative_SM_Indication == 0) {		

CID	16 bits	SS basic CID
UIUC	4 bits	
Repetition coding indication	2 bits	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
MIMO_Control	1 bit	For dual transmission capable SS 0: STTD 1: SM ~~For Collaborative SM capable SS~~ ~~0: pilot pattern A~~
}Else {		
CID_A	16 bits	Basic CID of SS that shall use pilot pattern A
UIUC_A	4 bits	UIUC used for the allocation that uses pilot pattern A
Repetition coding indication A	2 bits	Repetition coding used for the allocation that uses pilot pattern A 0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
CID_B	16 bits	Basic CID of SS that shall use pilot pattern B
UIUC_B	4 bits	UIUC used for the allocation that uses pilot pattern B
Repetition coding indication B	2 bits	Repetition coding used for the allocation that uses pilot pattern B 0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
Duration	10 bits	In OFDMA slots (see 8.4.3.1)
}		
Padding	*variable*	Number of bits required to align to byte length, shall be set to zero.
}		

Table 302f—MIMO UL Enhanced IE

Syntax	Size	Notes
MIMO_UL_Enhanced_IE (){		
Extended-2 UIUC	4 bits	MIMO_UL_enhanced_IE=0x06
Length	8 bits	Length in bytes
Num_Assign	4 bits	Number of burst assignment
For (j = 0; j< Num_assign; j++) {	--	--
Num_CID	2 bits	--

For (j = 0; j< Num_CID; j++) {		
CID	16 bits	MS basic CID
UIUC	4 bits	
Repetition coding indication	2 bits	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
Matrix Indicator	1 bit	For MS with dual antenna 0: Matrix A (STTD, see 8.4.8.4.3) 1: Matrix B (SM, see 8.4.8.4.3) For MS with single antenna, skip this field.
Pilot Pattern Indicator	1 bit	For MS with single antenna 0: pilot pattern A 1: pilot pattern B For MS with dual antenna (for PUSC only) 0: pilot pattern A/B 1: pilot pattern C/D
~~**Reserved**~~	~~2 bits~~	~~Shall be set to zero~~
}		
Duration	10 bits	In OFDMA slots (see 8.4.3.1)
}		
Padding	*variable*	Shall be set to zero.
}	--	--

Table 286f— MIMO in another BS IE

Syntax	Size	Notes
MIMO_in_another_BS_IE (){		
Extended-2 DIUC	4 bits	MIMO in another BS IE = 0x04
Length	4 bits	*Variable*
Segment	2 bits	Segment number
Used subchannels	6 bits	Used subchannels at other BS Bit #0: 0-11 Bit #1:12-19 Bit #2: 20-31 Bit #3: 32-39 Bit #4: 40-51 Bit #5:52-59
IDCell	5 bits	Cell ID of other BS
Num_Region	4 bits	—
Reserved	3 bits	Shall be set to zero.
For (i = 0; i< Num_Region; i++) {	--	--
~~Matrix_indicator~~	~~2 bits~~	~~See matrix indicator defined in STC_DL_Zone_IE~~
OFDMA Symbol offset	8 bits	--
If (Permutation = 0b11 and (AMC		

type is 2x3 or 1x6)) {		
Subchannel offset	8 bits	
Boosting	3 bits	
No. OFDMA Symbols	5 bits	
No. subchannels	6 bits	
} Else {		
Subchannel offset	6 bits	
Boosting	3 bits	
No. OFDMA Symbols	7 bits	
No. subchannels	6 bits	
}		
Matrix_indicator	2 bits	See matrix indicator defined in STC_DL_Zone_IE
Num_layer	2 bits	
Reserved	2 bit	Shall be set to zero
for (j = 0; j<= Num_layer; j++){		
if (INC_CID == 1) {		
CID	16 bits	--
}		
Layer_index	2 bits	--
DIUC	4 bits	0-11 burst profiles.
~~*Reserved*~~	~~2 bits~~	~~Shall be set to zero~~
Repetition coding indication	2 bits	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}		
}		
padding	*variable*	Number of bits required to align to byte length, shall be set to zero.
}		

Table 286g—Macro MIMO DL Basic IE()

Syntax	Size	Notes
Macro_MIMO_DL_Basic_IE(){	--	--
Extended-2 DIUC	4 bits	Macro MIMO DL Basic IE = 0x05
Length	8 bits	*variable*
Segment	2 bits	Segment number
Used subchannels	6 bits	Used subchannels at other BS Bit #0: 0-11 Bit #1:12-19 Bit #2: 20-31 Bit #3: 32-39 Bit #4: 40-51 Bit #5:52-59
Num_Region	4 bits	—

For (i = 0; i< Num_Region; i++) {	--	--
OFDMA Symbol offset	8 bits	--
If (Permutation = 0b11 and (AMC type is 2x3 or 1x6)) {		
Subchannel offset	8 bits	
Boosting	3 bits	
No. OFDMA Symbols	5 bits	
No. subchannels	6 bits	
} Else {		
Subchannel offset	6 bits	--
Boosting	3 bits	Refer to Table 273
No. OFDMA Symbols	7 bits	--
No. subchannels	6 bits	--
}		
Packet index	4 bits	Packet index for each region
Matrix_indicator	2 bits	See matrix indicator defined in STC_DL_Zone_IE
Num_layer	2 bits	
Reserved	2 bit	Shall be set to zero
for (j = 0; j<= Num_layer; j++){	--	--
if (INC_CID == 1) {	--	--
CID	16 bits	--
}		
Layer_index	2 bits	--
DIUC	4 bits	0-11 burst profiles.
~~*Reserved*~~	~~2 bits~~	~~Shall be set to zero~~
Repetition coding indication	2 bits	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b11: Repetition coding of 6 used
}	--	--
}	--	--
padding	*variable*	Number of bits required to align to byte length, shall be set to zero.
}	--	--