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Title Nibble-alignment for AAS-related MAP IEs

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Submitted

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Re: IEEE P802.16e/D8-2005

Abstract The document contains error correction of nibble-alignment for AAS_SDMA_IE and Sounding Command IEs.

Purpose Adoption of proposed changes into P802.16e/D8

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Nibble alignment for AAS-related MAP IEs

1. Problem statement

Each AAS SDMA DL IE, AAS SDMA UL IE and UL Sounding Command IE needs to be nibble-aligned. When there is an if-else clause, regardless of whether the ‘if’ clause or the ‘else’ clause is executed the resulting IE may be nibble-aligned. When there is a loop, nibble alignment may be required before the loop starts and inside the loop. But some AAS-related IEs do not observe the rule of nibble-alignment. The changes also include the editorial errors fix.

2. Remedy & Text change

Part I. AAS SDMA DL IE and AAS SDMA UL IE

[Modify the table 286y in 8.4.5.3.26 AAS_SDMA_DL_IE as follows]

Table 286y – AAS_SDMA_DL_IE

Syntax	Size (bits)	Notes
AAS_SDMA_DL_IE(){		
Extended-2 UIUCDIUC	4	AAS_SDMA_DL_IE = 0x0E
Length	8	<i>variable</i>
RCID_Type	2	00 = Normal CID 01 = RCID11 10 = RCID7 11 = RCID3
Num Burst Region	4	
<i>reserved</i>	<u>2</u>	
For (ii = 1: Num Region) {		Num Region=0
OFDMA symbol offset	8	Starting symbol offset referenced to DL preamble of the downlink frame specified by the Frame Offset
If (Permutation = 0b11) {		For the AMC permutation (2 x 3 type)
Subchannel offset	8	
No. OFDMA triple symbol	5	Number of OFDMA symbols is given in multiples of 3
No. subchannels	6	
}		
Else {		
Subchannel offset	6	
No. OFDMA triple symbol	7	
No. subchannels	6	
}		
Number of Users	3	SDMA users for the assigned region
<i>reserved</i>	<u>2</u>	

For (jj = 1: Num_Users) {		
RCID_IE()	<i>variable</i>	
Encoding Mode	2	00: No H-ARQ 01: H-ARQ Chase Combining 10: H-ARQ Incremental Redundancy 11: H-ARQ Conv. Code Incremental Redundancy
CQICH Allocation	1	0: Not Included 1: Included
ACKCH Allocation	1	0: Not Included 1: Optionally included for H-ARQ users
Pilot Pattern Modifier	1	0: Not Applied 1: Applied Shall be set to 0 if PUSC AAS zone
If (AAS DL Preamble Used) {		
Preamble Modifier Index	4	Preamble Modifier Index
}		
If (Pilot Pattern Modifier) {		
Pilot Pattern	2	See section 8.4.6.3.3 3 (AMC), 8.4.6.1.2.6 (TUSC) 00: Pattern #A , 01: Pattern #B 10: Pattern #C , 11: Pattern #D
<i>reserved</i>	<u>1</u>	
<i>} Else {</i>		
<i>reserved</i>	<u>3</u>	
}		
If (Encoding Mode == 00) {		No H-ARQ
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
<i>reserved</i>	<u>2</u>	
}		
If (Encoding Mode == 01) {		H-ARQ Chase Combining
If (ACKCH Allocation) {		
ACK CH Index	5	
<i>} Else {</i>		
<i>reserved</i>	<u>1</u>	
}		
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
ACID	4	
AI_SN	1	
}		
If (Encoding Mode == 10) {		H-ARQ Incremental Redundancy
If (ACKCH Allocation) {		

ACK CH Index	5	See DL Ack channel index in 8.4.5.4.24
<u>} Else {</u>		
<u>reserved</u>	<u>1</u>	
}		
NEP	4	
NSCH	4	Indicator for the number of first slots used for data encoding in this SDMA allocation
SPID	2	
ACID	4	
AI_SN	1	
}		
If (Encoding Mode = = 11) {		H-ARQ Conv. Code Incremental Redundancy
If (ACKCH Allocation) {		
ACK CH Index	5	See DL Ack channel index in 8.4.5.4.24
<u>reserved</u>	<u>2</u>	
<u>} Else {</u>		
<u>reserved</u>	<u>3</u>	
}		
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
SPID	2	
ACID	4	
AI_SN	1	
}		
If (CQICH Allocation Included) {		
Allocation Index	6	Index to the channel in a frame the CQI report should be transmitted by the SS
Period (p)	3	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS in every 2^p frames.
Frame offset	3	The MSS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the MSS should start reporting in 8 frames.
Duration (d)	4	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS for $2^{(d-1)}$ frames. If d is 0b0000, the CQICH is de-allocated. If d is 0b1111, the MSS should report until the BS command for the MSS to stop
}		
}		End of User loop
}		End of Burst Region Loop
Padding	<i>variable</i>	Padding to byte; shall be set to 0
}		

[Modify the table 302w in 8.4.5.4.28 AAS_SDMA_UL_IE as follows]

Table 302w – AAS_SDMA_UL_IE

Syntax	Size (bit)	Notes
AAS_SDMA_UL)IE() {		
Extended-2 UIUC	4	AAS_SDMA_UL_IE = 0x0E
Length	8	variable
RCID_Type	2	00 = Normal CID 01 = RCID11 10 = RCID7 11 = RCID3
Num Burst Region	4	
<i>reserved</i>	<u>2</u>	
For (ii = 1: Num Region) {	<u>2</u>	0b00 = No preamble 0b01 = Preamble used 0b10 0b11 = Reserved
Slot offset	12	Starting slot offset in AAS zone referenced to right after UL AAS preamble
Slot duration	10	
Number of Users	3	SDMA users for the assigned region
<i>reserved</i>	<u>3</u>	
For (jj = 1: Num_Users) {		
RCID_IE()	variable	
Encoding Mode	2	00: No H-ARQ 01: H-ARQ Chase Combining 10: H-ARQ Incremental Redundancy 11: H-ARQ Conv. Code Incremental Redundancy
Power Adjust	1	0: Not Included 1: Included; Signed integer in 0.25 dB Unit
Pilot Pattern Modifier	1	0: Not Applied 1: Applied
If (AAS UL Preamble Used) {		
Preamble Modifier Index	4	Preamble Modifier Index
}		
If (Pilot Pattern Modifier) {		Pilots per beam
Pilot Pattern	2	See sections 8.4.8.1.5 (Fig. 249) and 8.4.6.3.3 00: Pattern #A , 01: Pattern #B 10: Pattern #C , 11: Pattern #D
<i>reserved</i>	<u>2</u>	
}		
If (Encoding Mode == 00) {		
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
ACID	4	

<u>AI_SN</u>	<u>4</u>	
<u>reserved</u>	<u>2</u>	
}		
if (Encoding Mode == 01) {		<u>H-ARQ Chase Combining</u>
<u>DIUC</u>	<u>4</u>	
<u>Repetition Coding Indication</u>	<u>2</u>	<u>00: No repetition</u> <u>01: Repetition of 2</u> <u>10: Repetition of 4</u> <u>11: Repetition of 6</u>
<u>ACID</u>	<u>4</u>	
<u>AI_SN</u>	<u>1</u>	
<u>reserved</u>	<u>1</u>	
<u>↓</u>		
If (Encoding Mode == 10) {		
N_{EP}	4	
N_{SCH}	4	Indicator for the number of first slots used for data encoding in this SDMA allocation region
SPID	2	
ACID	4	
AI_SN	1	
<u>reserved</u>	<u>1</u>	
}		
If (Encoding Mode == 11) {		<u>H-ARQ Conv. Code Incremental Redundancy</u>
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
SPID	2	
ACID	4	
AI_SN	1	
<u>reserved</u>	<u>3</u>	
}		
If (Power Adjust Included) {		
Power adjustment	8	Signed integer in 0.25 dB Unit
}		
}		End of User loop
}		End of Burst Region Loop
padding	variable	Padding to byte; shall be set to 0
}		

Part II. UL Sounding Command IE

[Modify the table 316a in 8.4.6.8.1 UL_Sounding_Command_IE as follows]

Table 316a – UL_Sounding_Command_IE

Syntax	Size (bits)	Notes
UL_Sounding_Command_IE(){		
Extended-2 UIUC	4	UL_sounding_command_IE()=0x04
Length	8	<i>variable</i>
Sounding_Type	1	0: Type A 1: Type B
Send Sounding Report Flag	1	-
Sounding Relevance Flag	1	0 = Sounding relevance is the same for all CIDs 1 = Sounding relevance is specified for each CID
If(Sounding_Relevance_Flag==0) {		
Sounding Relevance	1	0 = All CIDs respond in the frame carrying the instruction 1 = All CIDs respond in next frame
<i>reserved</i>	<u>2</u>	
<i>} else {</i>		
<i>reserved</i>	<u>3</u>	
<i>}</i>		
Include additional feedback	2	0b00 = No additional feedback 0b01 = include channel coefficients (See 8.4.6.2.7.3) 0b10 = include received pilot coefficients 0b11 = include feedback message
If (Sounding_Type == 0) {		
Num_Sounding_symbols	3	Total number of sounding symbols being allocated, from 1 (0b 000) to 23 $2^3=8$ (0b 111)
Separability Type	1	0: occupy all subcarriers in the assigned bands; 1: occupy decimated subcarriers
If (Separability Type == 0) {		(using cyclic shift separability)
Max. Cyclic Shift Index P	3	0b000: P = 4; 0b001: P = 8; 0b010: P = 16; 0b011: P = 32; 0b100: P=9; 0b101: P=18 0b110-0b111:reserved
<i>reserved</i>	<u>1</u>	
<i>} Else {</i>	-	(using decimation separability)
Decimation Value D	3	Sound every Dth subcarrier within the sounding allocation. Decimation value D is 2 to the power of (1 plus this value), hence 2, 4, 8, ... up to maximum of 128, and 0b111 means decimation of 5.
Decimation offset randomization	1	0 = no randomization of decimation offset 1 = decimation offset pseudo-randomly determined
<i>}</i>		
for (i=0;i<Num_Sounding_symbols;i++){		

Sounding symbol index	3	Symbol index within the Sounding zone, from 1 (value 0b000) to 23 $2^3=8$ (value 0b111)
Number of CIDs	6	Number of CIDs sharing this sounding allocation
<i>reserved</i>	<u>3</u>	
for (j=0;j<Num_CIDs;j++){		
Shorted basic CID	12	12 LSBs of the MS basic CID value
Power Assignment Method	2	0b00 = equal power; 0b01 = <i>reserved</i> ; 0b10 = Interference dependent, Per sub-carrier power limit; 0b11 = Interference dependent, Total power limit;
Power boost	1	0 = no power boost 1 = power boost
Multi-antenna Flag	1	0 = MSS sounds first antenna only 1 = MSS sounds all antennas
Allocation Mode	1	0 = Normal 1 = Band AMC
If(Allocation Mode ==1) {		
Band Bit Map	12	See logical band defined in 6.3.18
<i>reserved</i>	<u>2</u>	
} Else {		
Starting Frequency Band	7	Out of 96 bands at most (FFT size dependent)
Number of frequency bands	7	Contiguous bands used for sounding
}		
If(Sounding Relevance Flag ==1) {		
Sounding_Relevance	1	-
<i>} Else {</i>		
<i>reserved</i>	<u>1</u>	
}		
If(Separability Type == 0) {		
Cyclic time shift index m	5	Cyclically shifts the time domain symbol by multiples (from 0 to P-1) of N/P where N=FFT size, and P=Max Cyclic Shift Index.
} Else {		
Decimation Offset d	6	Relative starting offset position for the first sounding occupied subcarrier in the sounding allocation
If(Include additional feedback ==01) {		
Use same symbol for additional feedback	1	0 = the additional feedback is sent in the symbol(s) following the allocated sounding symbol 1 = the additional feedback is sent in the same symbol as the allocated sounding symbol
<i>reserved</i>	<u>2</u>	
<i>} Else {</i>		
<i>reserved</i>	<u>3</u>	
}		
}		

Periodicity	3	0b000 = single command, not periodic, or terminate periodicity. Otherwise, repeat sounding once per r frames, where $r = 2^{(n-1)}$, where n is the decimal equivalent of the periodicity field
}		End of Num. of CID loop
}		End of Num_Sounding_symbols loop
} Else {		
Permutation	3	0b000 = PUSC permutation 0b001 = FUSC permutation 0b010 = Optional FUSC permutation 0b011 = Adjacent subcarrier permutation 0b100 = TUSC1 0b101 = TUSC2 0b110-0b111 = <i>Reserved</i>
IDcell	6	-
Num_Sounding_symbols	3	-
for (i=0;i<Num_Sounding_symbols;i++){	-	-
Number of CIDs	7	
<i>reserved</i>	<u>1</u>	
for (j=0;j<Num_CIDs;j++){	-	-
Shortened basic CID	12	12 LSBs of the MS basic CID value
If(Sounding_Relevance_Flag ==1) {		
Sounding_Relevance	1	0 = Respond in the frame carrying the instruction 1 = Respond in next frame
<i>reserved</i>	<u>3</u>	
}		
Subchannel offset	7	The lowest index subchannel used for carrying the burst, starting from subchannel 0
Power boost	1	0 = no power boost 1 = power boost
Number of subchannels	3	The number subchannels with subsequent indexes, used to carry the burst.
Periodicity	3	0b000 = single command, not periodic, or terminate periodicity. Otherwise, repeat sounding once per r frames, where $r = 2^{(n-1)}$, where n is the decimal equivalent of the periodicity field
Power Assignment Method	2	0b00 = equal power; 0b01 = <i>reserved</i> ; 0b10 = Interference dependent, Per sub-carrier power limit; 0b11 = Interference dependent, Total power limit;
}		
}		
}		
Padding	<i>variable</i>	Pad IE to octet boundary. Bits shall be set to 0
}		