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Title	**A MAP IE for H-ARQ and SDMA Allocation in AAS Zone**
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Re:	Call for reply comments **(Original Comment # 2189)**
Abstract	A new efficient Normal MAP IE supporting for Hybrid ARQ and SDMA allocation in AAS zone is proposed.
Purpose	Adoption in **IEEE 802.16e_D6**
Notice	
Release	
Patent Policy and Procedures	

A MAP IE for H-ARQ and SDMA Allocation in AAS Zone

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Introduction

In the current text, there is no efficient way to support Hybrid ARQ and SDMA allocations in AAS zone simultaneously. The operation scenario of the current schemes for SDMA allocation and Hybrid ARQ is as follows

1) H-ARQ pointer IE in (compressed) DL MAP to H-ARQ MAP
2) First PHY_MOD_IE in H-ARQ MAP (undefined yet) to specify the first SDMA preamble
   - Describe absolute 2D (DL) / 1D (UL) burst allocation regions
   - Describe the corresponding H-ARQ related IEs for each region
3) Second PHY_MOD_IE in H-ARQ MAP to specify the second SDMA preamble
   - Describe absolute 2D (DL) / 1D (UL) burst allocation regions
   - Describe the corresponding H-ARQ related IEs for each region
4) …

Thus, we can found out that bandwidth allocation overhead linearly increases as the number of SDMA users. Also, the number of PHY_MOD_IEs can be up to the maximum number of reused beams.

Proposed Solution

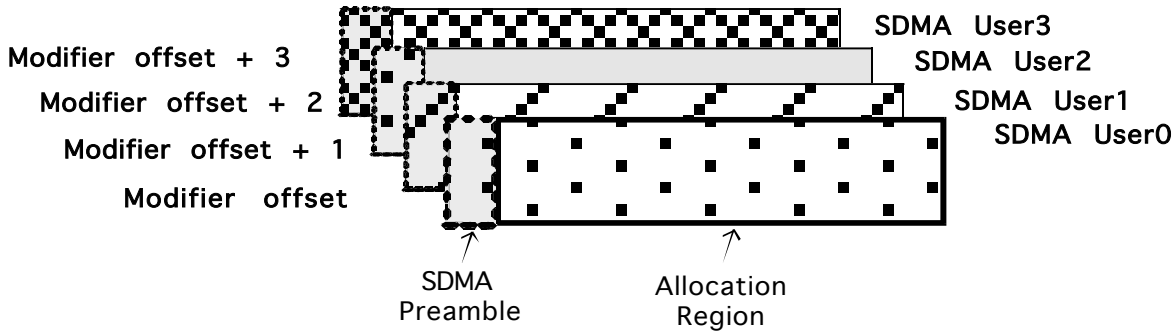

Fig. 1. Proposed SDMA Allocation Scenario

The burst allocation region of SDMA users can be fixed for scheduling simplicity and lower signaling overhead. In addition, modifier index for SDMA preamble can be extracted from description order of SDMA users. The proposed solution can be summarized as follows

1) Introduce Extended IUC in DL/UL MAP for SDMA allocation (Currently not available yet)
2) Use ‘1’ of ‘5’ reserved bits in AAS_IE() to specify modifier type, “Time” or “Freq.” shift
3) Describe the shared 2D (DL) or 1D (UL) allocation regions

- Specify {CID, modulation/coding schemes (IUC or H-ARQ)} fields
- Implicitly assign SDMA preamble index with description order of CIDs. Due to limited length of Extended IUC, starting offset of preamble modifier is included.
- Optionally include CQICH/ACKCH allocation IE for DL burst and uplink power adjustment IE.

4) Use a pointer IE for special Sub Map including the all information elements described above.

In this contribution, a new Normal MAP IE including the features 1) ~ 3) is proposed. Note that the mechanism supporting the feature 4) is a general MAC issue and is to be considered in other contributions (For example, see Sub Map mechanism in C80216e-05_23, Normal MAP Extension for H-ARQ)

Suggested Text Changes

[Add "Preamble Type Bit" into AAS_DL_IE in Sec. 8.4.5.3.3 and AAS_UL_IE in Sec. 8.4.5.4.6]

AAS_DL_IE in Sec. 8.4.5.3.3

Syntax	Size (bits)	Notes
AAS_DL_IE(){		
Extended DIUC	4	AAS = 0x02
Length	4	Length in bytes of following fields (0x03)
Permutation	2	0b 00 = PUSC 0b 01 = FUSC 0b 10 = Optional FUSC 0b 11 = AMC Permutation
DL PermBase	6	PermBase for AAS DL Zone
Symbol Offset	8	AAS zone starting offset referenced from DL frame preamble
AAS DL Preamble indication	2	0b 00 – 0 symbols 0b 01 – 1 symbols 0b 10 – 2 symbols 0b 11 – 3 symbols
Preamble Type	1	0 – Frequency shifted preamble is used in this AAS zone 1 – Time shifted preamble is used in this AAS zone
Padding	~~6~~ 5	
}		

AAS_UL_IE in Sec. 8.4.5.4.6

Syntax	Size (bits)	Notes
AAS_UL_IE(){		
Extended UIUC	4	AAS = 0x03
Length	4	Length in bytes of following fields (0x04)
Permutation	2	0b 00 = PUSC 0b 01 = FUSC 0b 10 = AMC Permutation 0b 11 = Reserved
UL PermBase	7	PermBase for AAS UL Zone
Symbol Offset	8	AAS zone starting offset referenced from 'Allocation Start Time' in the UL-MAP

AAS zone length	8	Number of OFDMA symbols in AAS zone
AAS UL Preamble indication	2	0b 00 – 0 symbols 0b 01 – 1 symbols 0b 10 – 2 symbols 0b 11 – 3 symbols
Preamble Type	1	0 – Frequency shifted preamble is used in this AAS zone 1 – Time shifted preamble is used in this AAS zone
Padding	~~5~~ 4	
}		

[Create a new AAS_H-ARQ_DL_IE in Sec. 8.4.5.3.x and AAS_H-ARQ_UL_IE in Sec. 8.4.5.4.x]

AAS_H-ARQ_DL_IE in Sec. 8.4.5.3.x

Syntax	Size (bit)	Notes
AAS_H-ARQ_DL_IE(){		
Extended DIUC	4	AAS_H-ARQ_DL_IE = 0x ??
Length	4	Length in bytes of following fields
OFDMA symbol offset	8	Starting symbol offset referenced to DL preamble of the downlink frame specified by the Frame Offset
Subchannel offset	8	
No of OFDMA symbols	7	
No of subchannels	7	
Number of Users	3	SDMA users for the assigned region
Preamble Modifier Index Offset	3	Starting offset of preamble modifier for SDMA users
For (ii = 1: Num_Users) {		
RCID12	12	LSB 12 bit of CID
Encoding Mode	2	00: No H-ARQ 01: H-ARQ Chase Combining 10: H-ARQ Incremental Redundancy 11: Reserved
CQICH Allocation	1	0: Not Included 1: Included
ACKCH Allocation	1	0: Not Included 1: Optionally included for H-ARQ users
If (Mode = = 00) {		
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
}		
else if (Mode = = 01) {		
If (ACKCH Allocation) {		
ACK CH Index	5	0b xxxx0 for the first half slot for ACK signaling 0b xxxx1 for the second half slot for ACK signaling where xxxx denotes slot index within ACKCH region

}		
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	
}		
else if (Mode = = 10) {		
If (ACKCH Allocation) {		
ACK CH Index	5	0b xxxx0 for the first half slot for ACK signaling 0b xxxx1 for the second half slot for ACK signaling where xxxx denotes slot index within ACKCH region
}		
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	
}		
If (CQICH Allocation Included) {		
Allocation index	6	
Reporting period	2	
Frame offset	3	
Reporting duration	4	
}		
}		End of User loop
Padding	variable	
}		

AAS_H-ARQ_UL_IE in Sec. 8.4.5.4.x

Syntax	Size (bit)	Notes
AAS_H-ARQ_UL_IE(){		
Extended UIUC	4	AAS_H-ARQ_UL_IE = 0x ??
Length	4	Length in bytes of following fields
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
Preamble Modifier Index Offset	3	Starting offset of preamble modifier for SDMA users
For (ii = 1: Num_Users) {		
RCID12	12	LSB 12 bit of CID

Encoding Mode	2	00: No H-ARQ 01: H-ARQ Chase Combining 10: H-ARQ Incremental Redundancy 11: Reserved
Power Adjust	1	0: Not Included 1: Included; Signed integer in 0.25 dB Unit
If (Mode = = 00) {		
DIUC	4	
Repetition Coding Indication	2	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
}		
else if (Mode = = 01) {		
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	
}		
else if (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	
}		
If (Power Adjust Included) {		
Power adjustment	8	Signed integer in 0.25 dB Unit
}		
}		End of User loop
Padding	variable	
}		