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Re:	IEEE P802.16-REVe/D6 and C802.16e-05/071r3		
Abstract	This contribution makes corrections for Reduced Private Maps		
Purpose	Adopt into P802.16e/D6		
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Corrections for Reduced Private Maps

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1 Problem Statement

Inconsistencies between the definition of reduced private maps and other aspects of the specification exist. In addition, recent changes to the definition of reduced private maps introduced errors. Specifically:

1) CQICH control fields were introduced into the CID section of the DL reduced private map. These fields should be contained in their own control field as done in other map IEs.
2) The reduced private maps will likely be used with the UL Sounding Zone which contains a periodicity field. For consistency, a periodicity field should be added to the reduced private map.
3) A mechanism to request channel feedback information was missing from the reduced private map definition.
4) The CRC-32 was mistakenly included within the NUM_IE loop
5) DL allocation did not consider TUSC permutations
6) The fact that the UL map was included within the NUM_IE loop was not clear
7) CRC-32 was used in the original reduced private map definition
8) A map type of 0b111 defines a HARQ MAP. A reserved bit is used to defined a compressed map. The nomenclature should be changed to make this more clear

2 Proposed Solution

1) Add a CQICH configuration included bit and move the appropriate fields into a new optional section.
2) Add a periodicity field that matches that of the sounding zone that applies to the DL and UL allocations made by the private map
3) Add a bit to the UL private map to request channel feedback.
4) Move the CRC-32 field outside the NUM_IE loop
5) Include TUSC permutation in triple symbol DL allocation section
6) Explicitly placed the UL map within the DL map NUM_IE loop and removed the loop from the UL map definition.
7) Utilize a CRC-16 to reduce MAP overhead
8) Move reserved bit to compressed map type field

3 Proposed Text Changes

[Editors Note: The following changes are relative to contribution C802.16e-05/071r3 which was accepted at session 36 (comment 2241) but not incorporated into P80216e_D6].

[Modify table 308a as follows:]

Table 308a—Reduced AAS private DL-MAP message format

Syntax	Size	Notes
Reduced_AAS_Private_DL-MAP() {		
Compressed map indicator	~~2~~ 3 bits	Set to binary 110 for compressed format
~~*Reserved*~~	~~1 bit~~	~~Shall be set to zero~~
UL-MAP appended	1 bit	
Compressed Map Type	2 bits	Shall be set to 0b11 for reduced private map
Multiple IE	1 bit	1 = Multiple IE Mode
Reserved	1 bit	Shall be set to zero
If (Multiple IE) {		
NUM IE	8 bits	NUM IE set to 1 if not in multiple IE mode
}		
For (ii = 1:NUM IE) {		
Periodicity	2 bits	00 = single command, not periodic, or terminate periodicity. Otherwise, repeat DL and UL allocations once per r frames, where r = 2^(n-1), where n is the decimal equivalent of the periodicity field.
CID Included	1 bit	1 = CID included The CID shall be included in the first compressed private MAP if it was pointed to by a DL-MAP IE with INC_CID == 0 or by a DL-MAP IE with a multicast CID.
DCD Count Included	1 bit	1 = DCD Count included The DCD count is expected to be the same as in the broadcast map that initiated the private map chain. The DCD count can be included in the private map if it changes.
PHY modification Included	1 bit	1 = included.
Encoding Mode	2 bits	Encoding for DL traffic burst 00: No H-ARQ 01: Chase Combing H-ARQ 10: Incremental Redundancy H-ARQ 11: Conv. Code Incremental Redundancy
CQICH Control Indicator	1 bit	1 = CQICH control information included.
Separate MCS Enabled	1 bit	Separate coding applied for reduced AAS_Private_MAP and DL data burst
If (Separate MCS Enabled) {		
Duration	10 bits	Slot duration for reduced AAS Private Map
DIUC	4 bits	Modulation & Coding Level
Repetition Coding Indication	2 bits	00: No repetition 01: Repetition of 2 10: Repetition of 4 11: Repetition of 6
}		
If (CID Included) {		
CID	16 bits	
}		
If (CQICH Control Indicator == 1) {		
Allocation Index	6 bits	CQICH Sub-channel index within Fast-feedback region marked with UIUC = 0

Report Period	~~2~~ 3 bits	Reporting period indicator (in frames)
Frame offset	3 bits	Start frame offset for initial reporting
Report Duration	4 bits	Reporting duration indicator
CQI Measurement Type	2 bits	0b00 – CINR measurement based upon DL allocation 0b01 – CINR measurement based upon DL frame preamble 0b10 – reserved 0b11 – reserved
Reserved	~~1~~ 2 bits	
}		
If (DCD Count Included) {		
DCD Count	8 bits	
}		
If (PHY modification Included) {		
Preamble Select	1 bit	0 = Frequency shifted preamble 1 = Time shifted preamble
Preamble Shift Index	4 bits	Updated preamble shift index to be used starting with the frame specified by the Frame Offset.
Reserved	3 bits	Set to zero
}		
DL Frame Offset	3 bits	
If (current zone permutation is FUSC or O-FUSC) {		
Zone symbol offset	8 bits	The offset of the OFDMA symbol in which the zone containing the burst starts, measured in OFDMA symbols from beginning of the downlink frame referred to by the Frame Offset.
}		
OFDMA Symbol Offset	8 bits	Starting symbol offset referenced to DL preamble of the downlink frame specified by the Frame Offset
~~If (Permutation = 0b11)~~ If (current zone permutation is AMC, TUSC1 or TUSC2) {		AMC (2 x 3 type), TUSC1 and TUSC2 all have triple symbol slot lengths
Subchannel offset	8 bits	
No. OFDMA triple symbol	5 bits	Number of OFDMA symbols is given in multiples of 3 symbols
No. subchannels	6 bits	
Else {		
Subchannel offset	6 bits	
No. OFDMA Symbols	7 bits	
No. subchannels	6 bits	
}		
DIUC/N_{EP}	4 bits	DIUC for Encoding Mode 00, 01, 11 N_{EP} for Encoding Mode 10
If (H-ARQ Enabled) {		
ACK Allocation Index	6 bits	ACK channel index within H-ARQ ACK region
ACID	4 bits	H-ARQ channel ID
AI_SN	1 bit	H-ARQ Seq. Number Indicator
Reserved	1 bits	
If (IR Type) {		Incremental Redundancy
N_{SCH}	4 bits	Applied for Encoding Mode 10

SPID	2 bits	Applied for Encoding Mode 10 and 11
Reserved	2 bits	
}		
}		
Repetition Coding Indication	2 bits	Applied for Encoding Modes 00 and 01 only 0b00 – No repetition coding 0b01 – Repetition coding of 2 used 0b10 – Repetition coding of 4 used 0b11 – Repetition coding of 6 used
If (UL-MAP appended) {		
Reduced_AAS_Private_UL-MAP()	Variable	
}		
Reserved	~~2~~ 3 bits	
} (end NUM IE loop)		
~~**CRC-32**~~ **CRC-16**	~~32~~ 16 bits	
~~} (end NUM IE loop)~~		
Nibble Padding	0/4 ~~variable~~	Padding depends upon H-ARQ options. ~~and if UL reduced map is appended. Padding should not be included in DL reduced map if UL reduced map is appended.~~
}		

[Add the following text following table 308a:]

A CRC 16-CCITT, as defined in ITU-T Recommendation X.25, shall be included at the end of each reduced private map. The CRC is computed across all bytes of the reduced map, including the appended UL map if included, starting with the byte containing the 'compressed map indicator' through the last byte of the map including padding.

[Modify Table 308b as follows:]

Table 308b— Reduced AAS private UL-MAP message format

Syntax	Size	Notes
Reduced_AAS_Private_UL-MAP() {		
~~For (ii = 1: NUM IE) {~~		
AAS zone configuration Included	1 bit	1 = AAS zone configuration included. AAS configuration should be included in the first UL map of a private map chain to define the UL AAS Zone.
AAS zone position Included	1 bit	1 = AAS zone position included. AAS zone position should be included in the first UL map of a private map chain to define the UL AAS Zone and any time the UL AAS zone is changed.
UCD Count Included	1 bit	1 = UCD Count included. The UCD count should be included in the first allocation of a private map chain.
PHY modification Included	1 bit	1 = Preamble shift index included.
Power Control Included	1 bit	1 = Power control value included
Include Feedback Header	2 bits	0b00 = No feedback 0b01 = MSS shall transmit a CINR feedback header (type 0b1011) based upon the DL allocation 0b10 = MSS shall transmit a CINR

		feedback header (type 0b1011) based upon the DL frame preamble 0b11 = Reserved
Encoding Mode	2 bits	Encoding for ~~DL~~ UL traffic burst 00: No H-ARQ 01: Chase Combing H-ARQ 10: Incremental Redundancy H-ARQ 11: Conv. Code Incremental Redundancy
if (AAS Zone Config Included) {		
Permutation	2 bits	0b00 = PUSC permutation 0b01 = Optional PUSC ~~FUSC~~ permutation 0b10 = AMC permutation 0b11 = Reserved
UL_PermBase	7 bits	
Preamble Indication	2 bits	~~0b00 = PUSC permutation~~ ~~0b01 = FUSC permutation~~ ~~0b10 = AMC permutation~~ ~~0b11 = Reserved~~ 0b00 - 0 symbols 0b01 - 1 symbols 0b10 - 2 symbols 0b11 - 3 symbols
Padding	5 bits	
}		
if (AAS Zone Position Included) {		
Zone Symbol Offset	8 bits	
Zone Length	8 bits	
}		
if (UCD Count Included) {		
UCD Count	8 bits	
} ~~(end of NUM IE)~~		
if (PHY modification Included) {		
Preamble Select	1 bit	0 = Frequency shifted preamble 1 = Time shifted preamble
Preamble Shift Index	4 bits	Updated preamble index to be used starting the with the frame specified by the Frame Offset
Reserved	3 bits	Set to zero
}		
if (Power Control Included) {		
Power Control	8 bits	Signed integer in 0.25 dB units
}		
UL Frame Offset	3 bits	
Slot Offset	12 bits	
Duration	10 bits	
UIUC/N_{EP}	4 bits	UIUC for Encoding Mode 00, 01, 11 N_{EP} for Encoding Mode 10
If (H-ARQ Enabled) {		
ACID	4 bits	H-ARQ channel ID
AI_SN	1 bit	H-ARQ Seq. Number Indicator
Reserved	3 bits	
If (IR Type) {		Incremental Redundancy
N_{SCH}	4 bits	Applied for Encoding Mode 10
SPID	2 bits	Applied for Encoding Mode 10 and 11
Reserved	2 bits	

}		
}		
Repetition Coding Indication	2	Applied for Encoding Mode 00 and 01 0b00: No repetition 0b01: Repetition of 2 0b10: Repetition of 4 0b11: Repetition of 6
~~**Padding Bits**~~	~~variable~~	
~~}~~		
}		