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Re:	IEEE 802.16j-07/019: "Call for Technical Comments Regarding IEEE Project 802.16j"
Abstract	This contribution proposes R-MAP message format for transparent RS systems
Purpose	Text proposal for 802.16j Baseline Document.
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R-MAP for Transparent RS Systems

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Introduction

In order to reduce the overhead of transparent RS, this contribution proposes the format of R-MAP for transparent RS systems. R-MAP is used for a parent station (MR-BS or RS) to signal the resource assignment for transparent RS. In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r4 are listed below.

Proposed text change

[Add the following subclause 6.3.2.3.91 in line 53 of page 65]
6.3.2.3.91 R-MAP message

This message may be used for a MR-BS or RS to signal the resource assignments and other control information to its subordinated transparent RS(s). The placement of R-MAP messages within a frame is same as SUB-DL-UL-MAP shown in Figure 23b. The INC_CID flag shall be reset to 0 in the beginning of R-MAP message. R-MAP message presented in Table xxx shall be sent without a generic MAC header.

Table xxx. R-MAP Message Format.

Syntax	Size	Notes
R-MAP message format {	—	—
R-MAP indicator	3 bits	Set to 0b111.
RCID_Type	2 bit	0b00 = Normal CID 0b01 = RCID11 0b10 = RCID7 0b11 = RCID3
MAP message length	11 bits	Length of R-MAP in bytes
DL IE count	6 bits	Number of DL IE in the burst.
UL IE count	6 bits	Number of UL IE in the burst.
for (i = 0; i < DL IE count; i++){	—	—
DL-MAP IE()		
}	—	—
for (i = 0; i < UL IE count; i++){	—	—
UL-MAP IE()		
}	—	—
While (map data remains)	—	—
R-link specific IE()	*variable*	see 8.4.5.9
}	—	—
Padding	*variable*	Padding to reach byte boundary
}	—	—

R-MAP indicator
  The value of 0b111 means this message is an R-MAP, where the MAP version in HARQ/Sub-MAP/R-MAP Pointer IE (see 8.4.5.3.10) shall be 0b11.
RCID_TYPE
  The RCID type used for RCID IEs specified in R-MAP IEs that are described in R-MAP.

MAP message length

    This value specifies the length of the R-MAP message beginning with the byte containing the R-MAP indicator and ending with the last byte of the R-MAP message. The length includes the computed 32-bit CRC value.

DL IE count

    The number of DL-MAP IEs.

UL IE count

    The number of UL-MAP IEs.

CRC

    A CRC-32 value is appended to the end of the R-MAP message. The CRC is computed across all bytes of the message starting with the byte containing the R-MAP indicator through the last byte of the map as specified by the Map message length field. The CRC calculation is the same as that used for standard MAC messages.

8.4.5.3 DL-MAP IE format

[Modified the Table 380 in page 150 as indexes]

Table 380—OFDMA DL-MAP IE format

Syntax	Size	Notes
DL-MAP_IE() {		
DIUC	4 bits	
if (DIUC == 14 {		
Extended-2 DIUC dependent IE	*variable*	
} else if (DIUC == 15) {		
Extended DIUC dependent IE	*variable*	See subclauses following 8.4.5.3.1
} else {		
if (INC_CID == 1) {		The DL-MAP starts with INC_CID =0. INC_CID is toggled between 0 and 1 by the CID-SWITCH_IE() (8.4.5.3.7)
If(included in R-MAP) {		
N_RCID	4 bits	Number of CIDs assigned for this IE
for (n=0; n< N_RCID; n++) {		
RCID_IE()	*variable*	For R-MAP, reduced CID format is used
}		
} else {		
N_CID	8 bits	Number of CIDs assigned for this IE
for (n=0; n< N_CID; n++) {		
If (included in SUB-DL-UL-MAP) {		
RCID_IE()	*variable*	For SUB-DL-UL-MAP, reduced CID format is used
} else {		
CID	16 bits	Represents the assignment of the IE to a broadcast, multicast, or unicast address.
}		
}		
}		
}		
OFDMA Symbol offset	8 bits	
if (Permutation = 0b11 and (AMC type is 2x3 or 1x6)) {		
Subchannel offset	8 bits	

Boosting	3 bits	000: normal (not boosted); 001: +6dB; 010: -6dB; 011: +9dB; 100: +3dB; 101: -3dB; 110: -9dB; 111: -12dB;	
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		
Boosting	3 bits	000: normal (not boosted); 001: +6dB; 010: -6dB; 011: +9dB; 100: +3dB; 101: -3dB; 110: -9dB; 111: -12dB;	
No. OFDMA Symbols	7 bits		
No. Subchannels	6 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	
}			
}			

[Modified the subclause 8.4.5.3.10 in page 153 as indexes]

8.4.5.3.10 HARQ and/Sub-MAP/R-MAP Pointer IE

This IE shall only be used by a BS supporting HARQ for MSs supporting HARQ, or providing R-MAP for transparent RS. There shall be at most four HARQ MAP Pointer IEs in the DL-MAP. Table 285 shows the format for the HARQ and/Sub-MAP/R-MAP Pointer IE.

Table 285—HARQ and/Sub-MAP/R-MAP Pointer IE format

Syntax	Size (bit)	Notes
HARQ and/Sub-MAP/R-MAP_Pointer_IE() {	—	—
Extended DIUC	4	HARQ-MAP/R-MAP_Pointer_IE = 0x07
Length	4	—
While (data remains) {	—	—
DIUC	4	Indicates the AMC level of the burst containing a HARQ MAP or R-MAP message
No. Slots	8	The number of slots allocated for the burst containing a HARQ MAP or R-MAP message
Repetition Coding Indication	2	0b00: No repetition coding 0b01: Repetition coding of 2 used 0b10: Repetition coding of 4 used 0b10: Repetition coding of 6 used
MAP Version	2	0b00: HARQ MAPv1 0b01: Submap 0b10: Submap with CID mask included 0b11: ReservedR-MAP
If (MAP Version == 0b10) {	—	—

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Idle users	1	Bursts for idle users included in the submap
Sleep users	1	Bursts for sleep users included in the submap
CID Mask Length	2	0b00: 12 bits 0b01: 20 bits 0b10: 36 bits 0b11: 52 bits
CID mask	*N*	n = The number of bits of CID mask is determined by CID Mask Length. When the MAP message pointed by this pointer IE includes any MAP IE for an awake mode MS, the bit index corresponding to ((Basic CID of the MS) MOD n) in this CID Mask field shall be set to 1. Otherwise, it may be set to 0.
}	—	—
}	—	—
Reserved	0 or 4	For a byte alignment of IE. Shall be set to zero
}	—	—

DIUC

Indicates the burst profile used for the HARQ MAP/ R-MAP message.

No. Slots

The number of OFDMA slots allocated for the burst containing a HARQ MAP or R-MAP message. The HARQ MAP Sub-MAP or R-MAP message shall directly follows the DL MAP, the number of the slots allocated for the HARQ MAP or R-MAP message.

MAP Version

Indicates the version theof HARQ MAP or R-MAP.

8.4.5.4 UL-MAP IE format

[Modified the Table 287 in page 154 as indexes]

Table 287—OFDMA UL-MAP IE format

Syntax	Size	Notes
UL-MAP_IE() {	—	—
If(included in R-MAP) {	—	—
RCID_IE()	*variable*	For R-MAP, reduced CID format is used
} else {	—	—
CID	16 bits	
}	—	—
UIUC	4 bits	
if (UIUC == 11) {		
Extended UIUC 2 dependent IE	*variable*	See 8.4.5.4.4.2
} else if (UIUC == 12) {		
OFDMA Symbol offset	8 bits	The offset of the OFDMA symbol in which the region starts, the offset value is defined in units of OFDMA symbols and is relevant to the Allocation Start Time field given in the UL-MAP message.
Subchannel offset	7 bits	The lowest index subchannel used for region, starting from subchannel 0.
No. OFDMA Symbols	7 bits	The number of OFDMA symbols that are used for the region.

No. Subchannels	7 bits	The number of subchannels with subsequent indices that are used for the region.
Ranging Method	2 bits	0b00: Initial ranging over two symbols 0b01: Initial ranging over four symbols 0b10: BR/periodic ranging over one symbol 0b11: BR/periodic ranging over three symbols
Dedicated ranging indicator	1 bit	0: The OFDMA region and ranging method defined are used for the purpose of normal ranging 1: The OFDMA region and ranging method defined are used for the purpose of ranging using dedicated CDMA code and transmission opportunities assigned in the MOB_PAG-ADV message or in the MOB_SCN-RSP message.
} else if (UIUC == 13) {	—	—
PAPR_Reduction_and_Safety_Zone_ Allocation_IE()	*variable*	
} else if (UIUC == 14) {	—	—
CDMA_Allocation_IE()	*variable*	
} else if (UIUC == 15) {	—	—
Extended UIUC-dependent IE	*variable*	See subclauses following 8.4.5.4.3
} else if (UIUC == 0) {	—	—
FAST-FEEDBACK_Allocation_IE()	*variable*	
} else {		
Duration	10 bits	In OFDMA slots (see 8.4.3.1)
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
If (AAS or AMC UL Zone) {		AAS/AMC Allocations include absolute slot offset.
Slot offset	12 bits	Offset from start of the AAS or AMC zone for this allocation, specified in slots.
}	—	—
}	—	—
}	—	—