Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	OFDMA Extended DIUC/UIUC and Extended-2 DIUC/UIUC Code Assignment Tables
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Re:	IEEE P802.16e/D7
Abstract	This contribution includes clarification on the current extended DL/UL IEs.
Purpose	Review and adopt suggested change into P802.16e/D7
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Clarifications on the Extended DIUC/UIUC

Lei Wang and Jiho Jang

1. Problem Statement

Extended DIUC/UIUC usage needs to be clarified and /corrected. There are several Extended DL/UL IEs using the same DIUC/UIUC.

2. Proposed Solutions

This contribution proposes an Extended-2 format to increase the number of types of Extended IE for OFDMA PHY mode. This new Extended-2 format is defined for both DL MAP and UL MAP. The DIUC 14 and UIUC 11 are used to identify this new format. All Extended IEs defined in 802.16d remain unchanged and are identified by Extended DIUC/UIUC (0x00… 0x0F). This contribution redefines all Extended IE defined in 802.16e.

This contribution also adds allocation tables for Extended DIUC/Extended UIUC and Extended-2 Types. By adding these tables, duplicating usage can be avoided.

3. Specific Text Changes

[Add the following subsection title right after the subsection title 8.4.5.3.2:]

8.4.5.3.2 DL-MAP extended IE format

8.4.5.3.2.1 DL-MAP extended IE format

[Append the following to the end of section 8.4.5.3.2:]

Table 277a defines the encoding for Extended DIUC that shall be used by DL-MAP Extended IEs.

Table 277a—Extended DIUC Code Assignment for DIUC=15

Extended DIUC	Usage
0x00	Channel_Measurement_IE
0x01	STC_Zone_IE
0x02	AAS_DL_IE
0x03	Data_location_in_another_BS_IE
0x04	CID_Switch_IE
0x05	MIMO_DL_Basic_IE
0x06	MIMO_DL_Enhanced_IE
0x07	H-ARQ_Map_Pointer_IE
0x08	PHYMOD_DL_IE
0x09-0x0A	reserved

0x0B	DL PUSC Burst Allocation in Other Segment
0x0C-0x0E	reserved
0x0F	UL_interference_and_noise_level_IE

[Insert the following section]

8.4.5.3.2.2 DL-MAP Extended-2 IE format

A DL-MAP IE entry with a DIUC value of 14, indicates that the IE carries special information and conforms to the structure shown in Table 277b. A station shall ignore an extended-2 IE entry with an extended-2 DIUC value for which the station has no knowledge. In the case of a known extended-2 DIUC value but with a length field longer than expected, the station shall process information up to the known length and ignore the remainder of the IE.

Table 277b—OFDMA DL-MAP extended-2 IE format

Syntax	Size	Note
DL_Extended-2_IE {		
Extended-2 DIUC	4 bits	0x00 … 0x0F
Length	8 bits	Length in bytes of Unspecified data field
Unspecified data	variable	
}		

Table 277c defines the encoding for Extended-2 DIUC that shall be used by DL-MAP Extended-2 IEs.

Table 277c—Extended-2 DIUC Code Assignment for DIUC=14

Extended-2 DIUC	Usage
0x00	MBS_MAP_IE
0x01	HO_Anchor_Active_DL_MAP_IE
0x02	HO_Active_Anchor_DL_MAP_IE
0x03	HO_CID_Translation_MAP_IE
0x04	MIMO_in_another_BS_IE
0x05	Macro-MIMO_DL_Basic_IE
0x06	Skip_IE
0x07	HARQ DL MAP IE
0x08	HARQ ACK IE
0x09	Enhanced DL MAP IE
0x0A	Closed-loop MIMO DL Enhanced IE
0x0B-0x0D	reserved
0x0E	AAS_SDMA_DL_IE
0x0F	Reserved

[Modify the following sections:]

8.4.5.3.12 Multicast and Broadcast Service MAP IE (MBS_MAP_IE)
……

Table 285a—Multicast and Broadcast Service MAP IE

Syntax	Size	Note
MBS_MAP_IE {		
Extended-2 DIUC	4 bits	MBS MAP_IE()=0x0A00
Length	4 8 bits	variable
…..		
}		

……

8.4.5.3.14 HO Anchor Active DL MAP IE
……

Table 285c—HO Anchor Active DL MAP IE

Syntax	Size	Note
HO Anchor Active DL MAP IE() {		
Extended-2 DIUC	4 bits	HO Anchor Active MAP IE() = 0x0C01
Length	4 8 bits	variable
…..		
}		

……

8.4.5.3.15 HO Active Anchor DL MAP IE
……

Table 285d—HO Active Anchor MAP IE

Syntax	Size	Note
HO Active_Anchor DL MAP IE () {		
Extended-2 DIUC	4 bits	HO Active_Anchor MAP IE = 0x0D02
Length	4 8 bits	variable
…..		
}		

……

8.4.5.3.16 HO CID Translation MAP IE
……

Table 285e—HO CID Translation MAP IE

Syntax	Size	Note
HO CID Translation		

MAP IE() {		
Extended-2 DIUC	4 bits	CID Translation MAP IE = 0x0E03
Length	4 8 bits	variable
…..		
}		

……

8.4.5.3.17 MIMO in another BS IE

In the DL-MAP, a BS may transmit DIUC=1514 with the MIMO_in_another_BS_IE () to indicate that data is transmitted to the MS through other BS at the same frame. This IE shall be right after the IE defining the same data or data region received in the anchor BS.

Table 285f—MIMO in another BS IE

Syntax	Size	Note
MIMO_in_another_BS_IE () {		
Extended-2 DIUC	4 bits	MIMO in another BS IE = 0x0904
Length	4 8 bits	variable
…..		
}		

……

8.4.5.3.18 Macro-MIMO DL Basic IE format
……

Table 285g—Macro MIMO DL Basic IE()

Syntax	Size	Note
Macro_MIMO_DL_Basic_IE() {		
Extended-2 DIUC	4 bits	Macro MIMO DL Basic IE = 0x0b05
Length	4 8 bits	variable
…..		
}		

……

8.4.5.3.27 AAS SDMA DL IE { format
……

Table 285u—AAS_SDMA_DL_IE

Syntax	Size	Note
AAS_SDMA_DL_IE() {		
Extended-2 DIUC	4 bits	AAS_SDMA_DL_IE = 0x0E
Length	4 8 bits	variable
…..		
}		

……

8.4.5.4.4 UL-MAP extended IE format

8.4.5.4.4.1 UL-MAP extended IE format

Table 289a defined the encoding for Extended UIUC that shall be used by UL-MAP Extended IEs.

Table 289a—Extended UIUC Code Assignment for UIUC=15

Extended UIUC	Usage
0x00	Power_control_IE
0x01	Mini-subchannel_allocation_IE
0x02	AAS_UL_IE
0x03	CQICH_Alloc_IE
0x04	UL Zone IE
0x05	PHYMOD_UL_IE
0x06	MIMO_UL_Basic_IE
0x07	UL_MAP_Fast_Tracking_IE
0x08	UL_PUSC_Burst_Allocation_in_Other_Segment_IE
0x09	Fast_Ranging_IE
0x0A … 0x0F	Reserved

8.4.5.4.4.2 UL-MAP Extended-2 IE Format

A UL-MAP IE entry with a UIUC value of 11, indicates that the IE carries special information and conforms to the structure shown in Table 289b. A station shall ignore an extended-2 IE entry with an extended-2 UIUC value for which the station has no knowledge. In the case of a known extended-2 UIUC value but with a length field longer than expected, the station shall process information up to the known length and ignore the remainder of the IE.

Table 289b—UL-MAP Extended-2 IE Format

Syntex	Size	Note
UL_Extended-2_IE() {		
Extended-2 UIUC	4 bits	0x00 … 0x0F
Length	8 bits	Length in bytes of Unspecified data field
Unspecific Data	Variable	
}		

Table 289c defines the encoding for Extended-2 UIUC that shall be used by UL-MAP Extended-2 IEs.

Table 289c—Extended-2 UIUC Code Assignment for UIUC=11

Extended-2 Type	Usage
0x00	CQICH_Enhanced Allocation_IE
0x01	HO_Anchor_Active_UL_MAP_IE
0x02	HO_Active Anchor UL MAP
0x03	Anchor_BS_switch_IE
0x04	UL_sounding_command_IE
0x05	reserved
0x06	MIMO UL Enhanced IE
0x07	HARQ UL MAP IE
0x08	HARQ ACKCH Region Allocation IE
0x09	UL Allocation start IE
0x0A … 0x0D	Reserved
0x0E	AAS_SDMA_UL_IE
0x0F	Feedback_polling_IE

[Modify the following sections:]

8.4.5.4.15 CQICH Enhanced Allocation IE format

Table 302a—CQICH Enhanced allocation IE format

Syntax	Size	Note
CQICH_Enhanced_Alloc_IE() {		
Extended-2 UIUC	4 bits	CQICH Enhance Alloc IE()=0x~~09~~00
Length	~~4~~ 8 bits	Length in bytes of following fields
…..		
}		

……

8.4.5.4.18 HO Anchor Active UL MAP IE
……

Table 302e—HO Anchor Active UL MAP IE

Syntax	Size	Note
HO Anchor Active UL MAP IE () {		
Extended-2 UIUC	4 bits	HO Anchor Active MAP IE() = 0x~~09~~01
Length	~~4~~ 8 bits	
…..		
}		

……

8.4.5.4.19 HO Active Anchor UL MAP IE

……

Table 302f—HO Active Anchor UL MAP IE

Syntax	Size	Note
HO Active_Anchor UL MAP IE () {		
Extended-2 UIUC	4 bits	HO Active_Anchor MAP IE() = 0x~~09~~02
Length	~~4~~ 8 bits	
…..		
}		

……

8.4.5.4.21 OFDMA Fast_Ranging_IE format

……

Table 302h—OFDMA Fast_Ranging_IE format

Syntax	Size	Note
Fast_Ranging_IE{		
Extended UIUC	4 bits	Fast_Ranging_IE() = 0x~~06~~09
Length	4 bits	variable
…..		
}		

……

8.4.5.4.22 UL_MAP_Fast_Tracking_IE

……

Table 302i—UL_MAP_Fast_Tracking_IE

Syntax	Size	Note
UL_MAP_Fast_Tracking_IE() {		
Extended UIUC	4 bits	Fast Tracking_IE() = 0x~~03~~07
Length	4 bits	Variable
…..		
}		

……

8.4.5.3.28 AAS SDMA UL IE format

……

Table 302r—AAS_SDMA_UL_ IE

Syntax	Size	Note
AAS_SDMA_UL_IE() {		

Extended-2 UIUC	4 bits	AAS_SDMA_UL_IE = 0x0E
Length	4 8 bits	variable
…..		
}		

……

8.4.6.2.8.1 Channel sounding

……

Table316a—UL_sounding_command_IE()

Syntax	Size	Note
UL_sounding_command_IE() {		
Extended-2 UIUC	4 bits	UL_sounding_command_IE()=0x0904
Length	4 8 bits	variable
…..		
}		

……

4. References

[1]   IEEE 802.16-2004 IEEE Standards for local and metropolitan area networks part 16: Air interface for fixed
           broadband wireless access systems
[2]   IEEE P802.16e/D7
[3]   C80216e-05/88r1
[4]   C80216e-05/160r1
[5]   C80216e-05/209