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Re:	IEEE 802.16-REVd/D1 Ballot
Abstract	
Purpose	Material for resolution of comment XXX in LB13
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Changing the status of Subchannelization
in OFDM mode

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Introduction

This contribution is triggered by the comment related to inability to describe full bandwidth uplink transmission with midambles in current UL-MAP IE, but it calls for deeper review of the UL functionality.

The way we propose to introduce this functionality is to introduce a "Subchannel Index" code for the case that all 16 subchannels are being aggregated into a full bandwidth transmission. This is illustrated below.
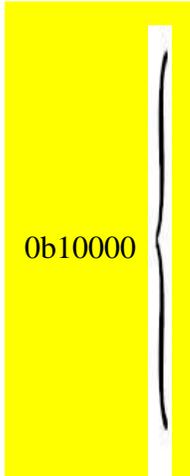
This solution calls for further thoughts about the OFDM functionality in general. Currently there are two UL map IE structures – one for stations incapable of subchannelization and the other for stations utilizing the subchannelized transmissions. It was recognized in the past that having these two regions in the UL frame reduces the efficiency of both, by imposing restrictions on how the traffic can be scheduled according to stations' capabilities.

The implementation of subchannelized Tx capability is quite easy, and in our view the implementation of the subchannelization in the SS needs to be mandatory. By having all 802.16-OFDM stations supporting the subchannelized transmission it becomes a decision of the Base Station manufacturer whether or not implement the UL subchannelization capability. If a BST does not support it, it simply does not invoke the "Subchannel Index" values associated with partial loading of the subcarriers.

2

Modified Text

Subcarrier allocation table

Modify as illustrated in the figure below:

Subchannel Index:				Allocated Frequency offset indices of carriers:
			0b00001:	{-100:-98, -37:-35, 1:3, 64:66}
		0b00010:		{-38}
	0b00100:		0b00011:	{ -97:-95, -34:-32, 4:6, 67:69}
			0b00101:	{ -94:-92, -31:-29, 7:9, 70:72}
		0b00110:		{13}
0b01000:			0b00111:	{ -91:-89, -28:-26, 10:12, 73:75}
			0b01001:	{ -87:-85, -50:-48, 14:16, 51:53}
		0b01010:		{-88}
	0b01100:		0b01011:	{ -84,-82, -47:-45, 17: 19, 54:56}
			0b01101:	{ -81:-79, -44:-42, 20:22, 57:59}
		0b01110:		{63}
			0b01111:	{ -78:-76, -41:-39, 23:25, 60:62}
			0b10001:	{ -75:-73, -12:-10, 26:28, 89:91}
		0b10010:		{-13}
	0b10100:		0b10011:	{ -72:-70, -9: -7, 29:31, 92:94}
			0b10101:	{ -69:-67, -6: -4, 32:34, 95:97}
		0b10110:		{38}
0b11000:			0b10111:	{ -66:-64, -3: -1, 35:37, 98:100}
			0b11001:	{ -62:-60, -25:-23, 39:41, 76:78}
		0b11010:		{-63}
	0b11100:		0b11011:	{ -59:-57, -22:-20, 42:44, 79:81}
			0b11101:	{ -56:-54, -19:-17, 45:47, 82:84}
		0b11110:		{88}
			0b11111:	{ -53:-51, -16:-14, 48:50, 85:87}

(highlighted leftmost label: 0b10000)

Note that pilot carriers are allocated only if two or more sub-channels are allocated.

The use of channel index 0b10000 implies that no subchannelization is employed. The use of all other subchannel indices in table 213 implies that subchannelization is employed.

8.4.5.3.1 UIUC Allocations

Change Burst profile 5 Subchannelization network entry IE
Change Burst profiles to 6-12

UL-MAP IE format

[delete the added text:]
~~When sub-channelization is active, UIUCs 1 and 3 shall not be used.~~

[modify the table (by deleting conditioning on subchannelization) to the form shown below:]

Table 1: OFDM UL-MAP information element format

Syntax	Size	Notes
UL-MAP_information_element() {		
CID	16 bits	
UIUC	4bits	
Start Time	11 bits	
if (UIUC == 4)		
Focused_contention_IE()	16 bits	
if (UIUC == 5)		
Subchannelized_Network_entry_IE()	12 bits	
if (UIUC == 15)		
Extended UIUC dependent IE	Variable	AAS_UL_IE()
Duration	10 bits	
Subchannel Index	5 bits	
Midamble Present	2 bits	0b00 = Preamble only 0b01 = Midambles after every 8 data symbols 0b10 = Midambles after every 16 data symbols 0b11 = Midambles after every 32 data symbols
Padding nibble	0/4 bits	Shall be set to 0x0
}		

[delete the IE_Subchannelization section 8.4.5.3.5 UL-MAP subchannelization IE format]

Full Contention Allocation

If the The Full Contention allocation appears in subchannelized region, the allocation is partitioned into Transmission
Opportunities (TOs) both in frequency and in time. The width (in subchannels) and length (in
OFDM symbols) of each transmission opportunity (TO) is defined in the UCD message defining UIUC=2.
The transmission of an SS shall contain a subchanelized preamble corresponding to the TO chosen, followed
by data OFDM symbols using the most robust mandatory burst profile.

Power Control

The SS transmitter shall support a monotonic power control level of 50dB.