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Title	Changes to Focused Contention in OFDM-256 Mode	
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Re:	Supporting document for Sponsor Ballot	
Abstract	Changes required in order to enable efficient Focused Contention in sub-channelized enabled BS.	
Purpose	The document is intended for consideration within comments resolution process.	
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Changes to Support Focused Contention with Sub-channelized Modes

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References

1. IEEE, "Draft IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems," IEEE P802.16-REVd/D3-2004.
2. Jerry Krinock, Manoneet Singh, Mike Paff, Arvind Lonkar, Lawrence Fung, 02/01/04, C802.16a-02/12, "Contention Schemes For OFDM Mode AL, Revision 0," http://grouper.ieee.org/groups/802/16/tga/contrib/C80216a-02_12.pdf.
3. Jerry Krinock, Manoneet Singh, Mike Paff, Arvind Lonkar, Lawrence Fung, 02/01/16, C802.16a-02/14, "Supplement to "Contention Schemes For OFDM Mode AL, Revision 0",," http://grouper.ieee.org/groups/802/16/tga/contrib/C80216a-02_14.pdf.

Introduction

The changes proposed in this document are to modify the Focused Contention option for the OFDM Physical Layer of IEEE P802.16-REVd [1], originally proposed as part of 802.16a by the contributions [2,3].

The changes are proposed in order to simplify the implementation of focused contention within both transmitters and receivers that support subchannelisation, by aligning the focused contention carriers with sub-sets of the subchannelisation carriers. In 1/16 bandwidth sub-channels there are 12 carriers: 4 groups of 3 carriers, and the intention is that each 1/16 sub-channel shall provide 3 focused contention groups for a total of 48 channels.

We propose that the scope of focused contention be extended to allow focused contention during symbols that, for other sub-channels, are allocated to carrying data. Because the focused contention mode is optional, this capability can be scheduled if it is thought beneficial to the basestation scheduling and if the basestation is capable of the decode. Indeed, the change to only support focused contention on a limited number of carrier groups means that the other channels are available for carrying data, subject to interference from the transmissions of users of neighbouring basestations.

For AAS it is advantageous if the lowest 3 bits of the Basestation ID (BSID) are used to select the subchannels from which the contention channels are selected. This can be done by allocation in the BS: it requires minimal new functionality in the SS.

Text Changes

Change 1

Replace,

Table 220—OFDM Contention channels

Page 440, Line 47 to Page 441, Line 12:

Contention channel index	Frequency offset index 0	Frequency offset index 1	Frequency offset index 2	Frequency offset index 3
0	-100	-50	1	51
1	-99	-49	2	52
2	-98	-48	3	53

Contention channel index	Frequency offset index 0	Frequency offset index 1	Frequency offset index 2	Frequency offset index 3
...
K	k-100	k-50	K+1	k+51
...
48	-52	-2	49	99
49	-51	-1	50	100

With

Contention channel index	Frequency offset index 0	Frequency offset index 1	Frequency offset index 2	Frequency offset index 3	Contention Channel belongs to subchannel (See Table 186)	Lowest 3 bits of BSID (for AAS capable BS)
0	-100	-37	1	64	00001	000
1	-99	-36	2	65	00001	000
2	-98	-35	3	66	00001	000
3	-97	-34	4	67	00011	000
4	-96	-33	5	68	00011	000
5	-95	-32	6	69	00011	000
6	-94	-31	7	70	00101	001
7	-93	-30	8	71	00101	001
8	-92	-29	9	72	00101	001
9	-91	-28	10	73	00111	001
10	-90	-27	11	74	00111	001
11	-89	-26	12	75	00111	001
12	-87	-50	14	51	01001	010
13	-86	-49	15	52	01001	010
14	-85	-48	16	53	01001	010
15	-84	-47	17	54	01011	010
16	-83	-46	18	55	01011	010
17	-82	-45	19	56	01011	010
18	-81	-44	20	57	01101	011
19	-80	-43	21	58	01101	011
20	-79	-42	22	59	01101	011
21	-78	-41	23	60	01111	011
22	-77	-40	24	61	01111	011
23	-76	-39	25	62	01111	011
24	-75	-12	26	89	10001	100
25	-74	-11	27	90	10001	100
26	-73	-10	28	91	10001	100
27	-72	-9	29	92	10011	100
28	-71	-8	30	93	10011	100
29	-70	-7	31	94	10011	100
30	-69	-6	32	95	10101	101
31	-68	-5	33	96	10101	101
32	-67	-4	34	97	10101	101

33	-66	-3	35	98	10111	101
34	-65	-2	36	99	10111	101
35	-64	-1	37	100	10111	101
36	-62	-25	39	76	11001	110
37	-61	-24	40	77	11001	110
38	-60	-23	41	78	11001	110
39	-59	-22	42	79	11011	110
40	-58	-21	43	80	11011	110
41	-57	-20	44	81	11011	110
42	-56	-19	45	82	11101	111
43	-55	-18	46	83	11101	111
44	-54	-17	47	84	11101	111
45	-53	-16	48	85	11111	111
46	-52	-15	49	86	11111	111
47	-51	-14	50	87	11111	111

Change 2

Edit section 8.3.6.3.1 Page 440 Line 1 as below:

8.3.6.3.1 Parameter selection

The SS shall examine the UL_MAP message for a future frame and select (in accordance with 6.4.8) a futureREQ Region during which to make its request. If Focused Contention Supported = 1 was returned by the BS in SBC-RSP message during SS initialization and if the SS is capable of focused contention, it may choose either a REQ Region-Full or REQ Region-Focused. Otherwise, it shall choose a REQ Region-Full. If the chosen REQ Region is a REQ Region-Focused, the SS shall also select [a contention code and a contention channel](#). ~~The contention code shall be selected at random with equal probability; a contention code from Table 219. The and similarly a contention channel shall be selected from Table 220 based upon a random selection with equal probability amongst the group of possible contention channel indices~~ ~~codes that are consistent with the allocation, as indicated in table 220.~~ The indices {-100 to +100} in the body of Table 220 refer to the subcarrier indices as defined in 8.3.2.4.

If the BS supports subchannelization, the last C_{SE} contention codes [of the allocation](#) shall only be used by subchannelization enabled SSs that wish to receive a subchannelized allocation. In response, the BS may provide the requested allocation as a subchannelized allocation; and may provide the requested allocation as a full (default) allocation, or may provide no allocation at all. The value of C_{SE} is transmitted in the UCD channel encoding TLV messages. The default value of C_{SE} is 0.

[An AAS enabled BS that supports Focused Contention shall only allocate the Focused Contention region consistent with the lowest 3 bits of the BSID.](#)

Change 3

(Pure Editorial) Edit section 8.3.6.3.3 Page 441 Line 27 as below:

8.3.6.3.3 Focused Contention transmission

The REQ Region-Focused bandwidth requesting mechanism consists of two phases. The Phase-1 is that an SS requesting bandwidth sends a signal to the BS in the uplink TO of REQ Region Focused identified by UIUC=3. One REQ Region Focused uplink interval with UIUC=3 shall be 4 subcarriers by two OFDM symbols. The Phase-1 bandwidth requesting signal transmission is described in this section. Following the Phase-1, the BS may include in its UL-MAP an allocation for the SS using UIUC=4 and the Focused_Contention_IE as defined in Table 210. The SS is identified in this Focused_Contention_IE by the Frame Number index, Transmit Opportunity index, Contention Channel index, and Contention Code index ~~which that~~ the SS used to send the Phase-1 bandwidth requesting signal. The Phase-2 is that the SS requesting

bandwidth responds to this UL-MAP allocation with a bandwidth request MAC header as defined in 6.4.2.1.2. The Phase-2 uplink interval with UIUC=4 shall consist of a short preamble and shall have the duration indicated by the relevant field of the UL-MAP_IE() and shall use the most robust mandatory burst profile.