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Comment On REQ-REGION FULL

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Alvarion

Introduction

80216d2 document allows use of UIUC=2 (REQ Region-Full) within subchannelized region. It is not described, however, how this capability is realized. In particular, it is not clear what constitutes a Transmit Opportunity in subchannelized region. The text below clarifies this by defining a TO as a subchannels*symbols rectangle, into which a REQ Region-Full is tiled. The size of the region is defined by a BST through a management message.
Minor wording improvements are suggested to Focused Contention part, without altering the technical meaning.

Proposed Text Changes:

8.4.5.4 Bandwidth requesting

There may be two types of Request (REQ) Regions in a frame. These two types are REQ Region-Full and REQ Region-Focused.
In a REQ Region-Full a station ~~shall~~may send a message containing a Bandwidth Request MAC Header. Each Transmit Opportunity shall consist of a ~~long~~short preamble and one OFDM symbol using the most robust mandatory burst profile.

In a REQ Region—Focused a station shall send a short code over ~~a~~each Transmit Opportunity which consists of 4 subcarriers by two OFDM symbols. Each Transmit Opportunity within a MAC frame shall be indexed by consecutive Transmit Opportunity Indices. The first occurring Transmit Opportunity shall be indexed 0.
All SSs shall be capable of the Full Contention Transmission. Capability of the Focused Contention Transmission is optional. The SS shall follow the backoff procedure as described in 6.2.8.

Parameter Selection

The SS shall examine the UL_MAP message for a future frame and select (in accordance with 6.2.8) a future REQ Region during which to make its request. If Focused Contention Supported = 1 is returned by the BS in the 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, at random with equal probability, a contention code from Table 1 and similarly a contention channel from Table 2.

Table 1: OFDM contention codes

Contention Code Index	bit 0	bit 1	bit 2	bit 3
0	1	1	1	1
1	1	-1	1	-1
2	1	1	-1	-1
3	1	-1	-1	1
4	-1	-1	-1	-1
5	-1	1	-1	1
6	-1	-1	1	1
7	-1	1	1	-1

Table 2: OFDM contention channels

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
...	...	...	...	...
k	k-100	k-50	k+1	k+51
...	...	...	...	...
48	-52	-2	+49	+99
49	-51	-1	+50	+100

Full Contention Transmission

If the chosen REQ Region is a REQ Region-Full, the SS shall transmit the short preamble as defined in **Error! Reference source not found.**, followed by a single OFDM symbol using the most robust mandatory burst profile containing a Bandwidth Request MAC Header.

If 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 subchannelized preamble corresponding to the TO chosen, followed by data OFDM symbols using the most robust mandatory burst profile.

Focused Contention Transmission

The REQ Region-Focused bandwidth requesting mechanism consists of two phases as defined in **Error! Reference source not found.**. In the first phase, a SS requesting bandwidth shall send a signal to the BS in the UL interval of REQ Region Focused identified by UIUC=3. One REQ Region Focused UL ~~interval~~TO with UIUC=3 shall be 4 subcarriers by two OFDM symbols. This bandwidth requesting signal transmission is described subsequently. In the second phase, allocated with UIUC=4, if the content of Focused_Contention_IE matches the TO used by the SS in the first phase, the SS ~~shall~~ may send a Bandwidth Request MAC Header using the most robust mandatory burst profile.

If the chosen REQ Region is a REQ Region-Focused, after choosing its four parameters, the SS shall transmit, during the chosen Transmit Opportunity in the chosen frame, four carriers which comprise the chosen contention channel. The amplitude of all other carriers shall be zero.

During both OFDM symbols, the amplitude of each of the four carriers shall be boosted somewhat above its normal amplitude, i.e. that used during a non-contention OFDM symbol, including the current power-control correction. The boost in dB shall equal the value of the Focused Contention Power Boost parameter in the current Uplink Channel Descriptor (UCD).
During the first OFDM symbol of the Transmit Opportunity, the phase of the four carriers is not specified.
During the second OFDM symbol of the Transmit Opportunity, the phases shall depend on the corresponding bit in the chosen contention code, and the phase transmitted during the first OFDM symbol on the same carrier. If the code bit is +1, the phase shall be the same as that transmitted during the first OFDM symbol. If the code bit is -1, the phase shall be inverted, 180 degrees with respect to the phase transmitted during the first OFDM symbol.

8.4.5.3 UL-MAP IE format

…
Delete the foot note at the end of table 116ax

8.4.5.3.2 UL-MAP Focused Contention IE format

Table 3 defines the UL-MAP IE for allocation Bandwidth (BW) for a SS that requested bandwidth using Focused Contention Reservation Requests. This UL-MAP IE is identified by UIUC = 4 (see Table **Error! Bookmark not defined.**). A SS responding to a bandwidth allocation using the Focused Contention IE shall start its burst with a short preamble (see **Error! Reference source not found.**) and use only the most robust mandatory burst profile in that burst.

Table 3: OFDM Focused Contention Information Element format

Syntax	Size	Notes
Focused_Contention_IE() {		
Transmit Opportunity Index	6 bits	
Contention Channel Index	6 bits	
Contention Code Index	43 bits	
Reserved	1 bit	Shall be set to zero
}		

Transmit Opportunity Index

Index number of the Transmit Opportunity that was used in the Bandwidth Request, which this message is responding to. Focused Contention Reservation Requests Transmit Opportunities are numbered from 63 to 0, starting from the beginning of the frame where the UL-MAP is transmitted.

Contention Channel Index

Index number of the Contention Channel that was used in the Bandwidth Request, which this message is responding to.

Contention Code Index

Index number of the Contention Code that was used in the Bandwidth Request, which this message is responding to.

[Add in table 123b UCD paramter table]

Table 4: UL channel descriptor TLVs

Name	Type	Length	Value
Uplink_Burst_Profile	1		May appear more than once. The length is the number of bytes in the overall object, including embedded TLV items.
Frequency	3	4	Uplink center frequency (kHz).
Contention-based Reservation Timeout	10	1	Number of UL-MAPs to receive before contention- based reservation is attempted again for the same connection.
Channel Width	11	2	Uplink channel width, increments of 10 KHz
Subchannelized initial ranging	18	1	Indicates whether subchannelized initial ranging is supported 0 = Not supported 1 = Supported
Subchannelization focused contention code	19	1	Number of contention codes (C_{SE}) that shall only be used to request a sub-channelized allocation. Default value 0. Allowed values 0-48.
Subchannelization REQ Region-FullParameters	20	1	Bits 0…2 Number of subchannels used by each transmit opportunity when REQ Region-Full is allocated in subchannelization region, per the following enumeration: 0: 1 Subchannel. 1: 2 Subchannels. 2: 4 Subchannels. 3: 8 Subchannels. 4: 16 Subchannels. 5-7: Shall not be used. Bits 3…7: Number of OFDM symbols used by each transmit opportunity when REQ Region-Full is allocated in subchannelization region.