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Re:	Working Group Review of Working Document P80216h_D1
Abstract	This contribution proposes to map MATI and SATI within the coexistence control channel CXCC to support the over the air advertisement phase of the credit token based co-existence protocol. This contribution is related to the comments #29, #30, #67 and #173 provided in the review [2] corresponding to the IEEE 802.16 Working Group Letter Ballot #24. The proposed text is intended to update text in subclauses 6.3.2.3.64, 6.3.2.3.65, 10.5.3 and 15.4.2.5.6 of the draft [1].
Purpose	Propose contribution to map MATI and SATI within CXCC.
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MATI and SATI Mapping within CXCC

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Overview

This contribution proposes to map MATI and SATI within the coexistence control channel CXCC to support the over the air advertisement phase of the credit token based co-existence protocol. This contribution is related to the comments #29, #30, #67 and #173 provided in the review [2] corresponding to the IEEE 802.16 Working Group Letter Ballot #24. The proposed text is intended to update text in subclauses 6.3.2.3.64, 6.3.2.3.65, 10.5.3 and 15.4.2.5.6 of the draft [1].

Specific editorial changes

This section provides a list of changes to the draft document.

Blue text represents specific editorial additions.

~~Red strikethrough~~ text is to be deleted.

Black text is text already in the draft.

Bold italic text is editorial instructions to the editor.

Overview

The MATI and SATI slots conveying the over the air advertisement messages (MADD and SADD) can be mapped within the co-existence control channel (CXCC) cycle proposed in subclause 10.5.3. In the CXCC cycle proposed in Table 345d, some slots (spare) are not used, and can therefore be used for MATI and SATI purposes for the transmissions of MADD and SADD messages. Assuming that the co-existence community is of size 3, it is proposed to consider 3 MATI and 3 SATI within the CXCC.

Text proposal for section 10.5.3

Replace Table 345d by the one below (related to comment #67 of [2]).

Table 345d—Coexistence Control Channel Function and Frame Numbering Scheme

Function Of Control Channel	Control Channel Function Name & Chapter	CX_MAC_NO containing Control Channel for given Frame Duration			
		5 ms	10 ms	20 ms	Starting Time WRT Absolute Reference (msec)
GPS Timing Recovery (DL)	TBD GPS timing recovery	1	1	1	0
GPS Timing Recovery		41	21	11	200

(UL)					
GPS Timing Recovery (DL)		81	41	21	400
GPS Timing Recovery (UL)		121	61	31	600
GPS Timing Recovery (DL)		161	81	41	800
GPS Timing Recovery (UL)		201	101	51	1000
GPS Timing Recovery (UL)		241	121	61	1200
CX_CMI_D1		281	141	71	1400
CX_CMI_U1		321	161	81	1600
CX_CMI_D2		361	181	91	1800
No+Io		401	201	101	2000
CX_CMI_U2		441	221	111	2200
AT2		481	241	121	2400
Spare	TBD use	521	261	131	2600
CX_CMI_D3		561	281	141	2800
No+Io		601	301	151	3000
Spare		641	321	161	3200
CX_CMI_U3		681	341	171	3400
AT3		721	361	181	3600
Spare	TBD use	761	381	191	3800
No+Io		801	401	201	4000
CX_CMI_D4	Reserved	841	421	211	4200
Spare		881	441	221	4400
CX_CMI_U4	Reserved	921	461	231	4600
AT4		961	481	241	4800
No+Io		1001	501	251	5000

Spare	TBD	1041	521	261	5200
CX_CMI_D5	Reserved	1081	541	271	5400
Spare		1121	561	281	5600
CX_CMI_U5	Reserved	1161	581	291	5800
No+Io		1201	601	301	6000
Spare		1241	621	311	6200
CX_CMI_D6	Reserved	1281	641	321	6400
Spare	TBD use	1321	661	331	6600
CX_CMI_U6	Reserved	1361	681	341	6800
No+Io		1401	701	351	7000
Freq_Key 1		1441	721	361	7200
Freq_Key 2		1481	741	371	7400
Freq_Key 3		1521	761	381	7600
Freq_Key 4		1561	781	391	7800
No+Io		1601	801	401	8000
~~Spare~~MATI		1641	821	411	8200
~~Spare~~SATI		1681	841	421	8400
~~Spare~~MATI		1721	861	431	8600
~~Spare~~SATI		1761	881	441	8800
~~No+Io~~MATI		1801	901	451	9000
~~Spare~~SATI		1841	921	461	9200
No+Io~~Spare~~		1881	941	471	9400
Spare		1921	961	481	9600
Spare		1961	981	491	9800

Text proposal for section 6.3.2.3.64

Replace the beginning of the text of section 6.3.2.3.64 by the amended text below (related to comment #29 of [2]).

The Master Advertisement Discovery Descriptor (MADD) message specifies the advertisement discovery information sent by the master BS towards the SSs located in the overlapped area of this master cell with the surrounding slave cells. This information is sent periodically by the master BS in MATI in downlink (section ***Error! Reference source not found.***) within the coexistence control channel CXCC.~~on a given channel (frequency domain). This information is sent every T_{MATI} (time interval between two consecutive MATIs). These consecutive MATIs (TBD) are part of an advertisement discovery sequence of time duration TAD. This sequence occurs cyclically. The time interval between two sequences is of time duration Ts~~. MADD provides the necessary information to the SSs of the surrounding slave cells to inform the slave BSs about possibilities of radio resources sharing with this master cell.

Text proposal for section 6.3.2.3.65

Replace the beginning of the text of section 6.3.2.3.65 by the amended text below (related to comment #30 of [2]).

The Slave Advertisement Discovery Descriptor (SADD) message specifies the advertisement discovery information sent by the slave BS towards the SSs located in the overlapped area of this slave cell with the surrounding master cells. This information is sent periodically by the slave BS in SATI in downlink (section***Error! Reference source not found.***) within the coexistence control channel CXCC.~~on a given channel (frequency domain). This information is sent every T_{SATI} (time interval between two consecutive SATIs). These consecutive SATIs (TBD) are part of an advertisement discovery sequence of time duration TS. This sequence occurs cyclically. The time interval between two consequences is of time duration Ts.~~ SADD provides the necessary information to the SSs of the surrounding master cells to inform the master BSs about possibilities of radio resources sharing with this master cell.

Text proposal for section 15.4.2.5.6

Replace the beginning of the text of section 15.4.2.5.6 by the amended text below (related to comment #173 of [2]).

To facilitate urgent (critical time) case or case when BSIS is not valid, ~~O~~over the air signaling for the first phase (advertisement) of the negotiation cycle would be also of great support to facilitate ~~urgent (critical time)~~ radio resources sharing opportunities discovery between IEEE WirelessMAN-CX systems themselves, but also between IEEE WirelessMAN-CX systems and non IEEE WirelessMAN-CX systems. This section describes discovery messages and procedures so that:

- Master BSs can advertise periodically to the neighboring slave BSs about their offers of radio resources for renting. This enables the slave BSs to be aware of master BSs' offers.

- Slave BSs can inform periodically the surrounding cells about their search of radio resources sharing opportunities for renting. This enables slave BSs to inform the master BSs that they are looking for temporally some additional radio resources.

Specific master BS and slave BS downlink time intervals ~~(TBD)~~ are used to support the over the air advertisement discovery messages in support of the credit token~~s~~ based negotiation. These time intervals

(subclause 10.5.3)~~, not yet defined, are temporary called~~ are respectively named MATI (Master Advertisement Time Interval) and SATI (Slave Advertisement Time Interval).

Usage of MATI and SATI within CXCC~~the advertisement discovery MAC frame structure~~

The usage of MATI is:~~and SATI is described in this paragraph.~~

- The MATIs are dedicated to master BS transmissions in downlink.

- Each MATI is used by a master BS in downlink for broadcasting. At a given time, each MATI can only be used by a single BS ~~among~~ within the co-existence neighborhood.~~ However, a same MATI can be used by different BSs at different times.~~

- Each master BS can use any MATI provided it is not already used by any other MATI BS of the co-existence neighborhood.

- MADD (Master Advertisement Discovery Descriptor) message is sent in MATI (Section ***Error! Reference source not found.***).

~~- The MATIs are ranked in each *Advertisement discovery sequence* in such a way that the first MATI is assigned to the master BS whose renting period will occur first (i.e. min of the T_Start_M), the second MATI is assigned to the master BS whose renting period will occur in second, and so on. Re-ranking is updated dynamically each time a new master BS is arriving. This mechanism avoids the SSs of the slave cells (see paragraph "*Advertisement discovery from master cell by slave cell*" below) to scan all MATIs when the slave cells have to find very shortly some available resources to rent. In this manner, they have directly knowledge of the next available resources they can propose credit tokens for.~~

- Each master cell releases the MATI it is using when its negotiation starting time has elapsed. This enables new arriving master cells to use this MATI (eventually after the re-ranking) to advertise incoming ~~channels~~ radio resource reuse opportunities.

The usage of SATI is:

- The SATIs are dedicated to slave BS transmissions in downlink.

- Each SATI is used by a slave BS in downlink for broadcasting. Each SATI can only be used by a single BS among the co-existence neighborhood. ~~However, a same SATI can be used by different slave BSs at different times.~~

- Each slave BS can use any SATI provided it is not already used by any other slave BS of the co-existence neighborhood.

- SADD (Slave Advertisement Discovery Descriptor) message is sent in SATI (Section ***Error! Reference source not found.***).

- A "master" SS is a SS belonging to a master cell. A "slave" SS is a SS belonging to a slave cell.

~~-~~The MATI and SATI time positions are known by the "master" and "slave" SSs within CXCC.

—There are no direct RF communications between the master and slave BSs. The master-slave BS communications are performed via master and slave SSs which act as RF bridges to convey the information as follows:

- A “slave” SS performs the RF bridge between its slavehome BS and the foreign master BS (provided the coverage of the master cell overlaps with the slave cell area, and this slave SS is located in the overlapping area).

- A “master” SS performs the RF bridge between its masterhome BS and the foreign slave BS (provided the coverage of the slave cell overlaps with the master cell area, and this master SS is located in the overlapping area).

—Slave SSs in the overlapped (master/slave) cell area listen to the MATIs. Master SSs in the overlapped (master/slave) cell area listen to the SATIs.

References

[1] IEEE 802.16h/D1: Part 16: Air Interface for Fixed Broadband Wireless Access Systems Amendment for Improved Coexistence Mechanisms for License-Exempt Operation; 2006-10-10
[2] IEEE 802.16 Working Group Letter Ballot #24 comments review, “LB24_Grandblaise_David.cmtb”, 2006-11-05