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Title	**Changes to the Sections 6.3.2.3.62 Re:Base Station Descriptor message**
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Re:	Changes to Draft Standard
Abstract	Editorial changes with addition of new content derived from comments.
Purpose	Add consistency and clarity to draft document.
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Changes to the Sections 6.3.2.3.62 Re: Base Station Descriptor message

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Introduction

Sections 6.3.2.3.62 in current draft document [1] has editorial revisions made to it and technical details were elaborated in order to maintain consistency and compliance. The changes are primarily editorial, however, new fields have been added as noted.

Specific Editorial Changes

This section provides a list of changes to [1] .

Blue Underlined text represents specific editorial additions
~~Red strikethrough text~~ is to be deleted.
Black text is already in the draft.
Bold Italic text is editorial instructions to the editor.
Green Font changes as a result of Session 47 revision 1

Make the following changes to Section 6.3.2.3.62 located between line 35 and line 65 of page 8 of [1].

6.3.2.3.62 Base Station Descriptor (BSD) message

The base station descriptor (BSD) message ~~specifies~~ contains the ~~base station~~ identification, RF emission, and RF sensor detection information about the Base Station. This message is sent only in the ~~CMI~~ CX_CMI_D(n) slot of the CXCC (see 15.3.2.1 ~~*15.1.4.1.2*~~) claimed by the Base Station and it is intended to be decoded as intelligible interference by ~~SSs~~ subscriber stations associated to other systems (see 15.3.2.4).

The BSD ~~has two purposes. First, it~~ contains pertinent information related to the base station, allowing foreign (interfered-with) ~~S~~subscriber ~~S~~stations to identify it as interference. ~~Secondly, it allows the differentiation of a CMI from a non-CMI. When it is received, the SS associated with the BS will recognize the interval containing the BSD message as a CMI, and will transmit SSURF messages in response to it. Note that SSURF will use the uplink bandwidth granted only in the CMI, and is not transmitted in the data link.~~

The length of BSD message is an integral number of bytes. The MAC message containing the ~~The~~ BSD message~~s~~ also contain an UL_MAP message instructing SSURF messages (6.3.2.3.63) to be sent in the complementary CX_CMI_U(n) slot. ~~are generated and broadcast within the downlink portion of a CMI every~~

~~minute by a base station.~~

A BSD message shall include the following parameters:

IP_Proxy address information: The Coexistence Proxy IP address information provides the IP address of the Coexistence Proxy Server. The encoding of this field is given below in TLV format.

BS EIRP: The BS EIRP ~~field is included within this message to help determine the interference potential~~. It is signed in units of 1 dBm. The EIRP at which the BSD message was sent; usually the maximum allowable EIRP for the operation of this Base Station.

BS ID: Base Station Identifier.

Make the following changes to Section 6.3.2.3.62 located between line 1 and line 4 of page 9 of [1]. New material is added here, old material is deleted as shown.

~~RF Antenna Sector ID: The RF antenna sector ID is used to identify the RF antenna in a base station if multiple RF antennas are used for RF reuse purpose.~~

BS_RF_Sector _ID: The RF antenna sector ID is used to identify the RF transmitting antenna at the base station where multiple RF antennas may be used. It contains information about the azimuth direction (with respect to True North) and -3 dB azimuth beamwidth of the antenna pattern .

BS_GPS_LOC: The GPS location of the Base Station emitting the BSD

BS_HGHT: The height of the antenna emitting the BSD

~~**PSD_V:** The PSD of the operational band as measured at this base station with the given time stamp. Consists of the resolution bandwidth of spectrum detector, Mean RSSI per ResBW interval with Var, in~~

Make the following changes to Table 108 aa located between line 6 and line 22 of page 9 of [1]. New material is added here, old material is deleted as shown.

Table 108aa-- BSD message format

Syntax	*Size*	*Notes*
BSD_Message_Format ( ) {		
Management Message Type =67	*8 bits*	
BS EIRP	*8 bits*	*dBm*
BS_GPS_LOC	*32 bits*	*16 MSB for BS Lat 16 LSB for BS long*
BS_HGHT	*16*	*Height of BS antenna above sea level in meters.*

~~*PSD_V*~~	~~*88 bits*~~	~~*Bit 0-31: UTC_CS of PSD*~~ ~~*Bit 32-36 Res BW in MHz*~~ ~~*Bits37_87:Dfreq_MeanRSSI_Var-vector*~~
~~*BS RF antenna sector ID*~~ *BS_RF_Sector ID*	~~*8*~~ *16 bits*	*Bits 0-7 For Azimuth of bean wrt true north, 2 degree steps* *Bits 8-15 for –3db Azimuth Beamwidth , 2 degree steps.*
BS IP_Address_IE( )	*Variable*	*TLV specific*
}		

Delete entirely the material currently located between line 23 and line 65 of Page 9 of [1].

The following new material as a new Section 15.3.2.4 Starting at Line 42 on Page 78 of [1].

15.3.2.4 Interference Messaging: Base Station Descriptor Message (BSD)

The Base Station Descriptor (BSD) Message (6.3.2.3.62) is used for basic interference identification and establishment of connectivity in WirelessMAN-CX systems. This message is sent by the BS only within a specific downlink slot CX_CMI_D(n) in the CXCC.

A CX_CMI_D(n) slot is thus "claimed" by having a BS decide to continually send BSD messages in it. Claiming is only undertaken after the slot is ascertained as being free of any occupancy by the procedures described in Sections 15.3.2.2 and 15.3.2.3. There are (n) such slots assigned to a channel. A channel is chosen based on the occupancy of the CX_CMI_U(n) by procedures outlined in 15.3.2.3.

A claimed slot indicates that the Base Station may be able to form a coexistence community with up to 2 ~~(or 5 in future)~~ other systems that are co-channel. It also indicates to other entering BS (IBS) the active presence of a co-channel BS.

The BSD is sent at the lowest, most robust data rate (1/2 QPSK). This delimits the furthest radiation extent of demodulatable signals from the Base Station and in essence delimits the range of interference that Base Station can cause. The BSD contains information on the IP proxy address of the Base Station. When the BSD is received by a subscriber station as interference, the subscriber station relays this to its Base Station using the BS_CCID_IND message (6.3.2.3.67). The extracted IP address can then be used to undertake the coexistence resolution protocol between the source and the affected Base Stations.

The BSD also contains information about the EIRP, direction and type of radiation pattern, GPS location of the Base Station sending the BSD, and information about the power spectral density of the whole band in which the BSD operates. Combined with the received signal strength at the affected SS, this information is useful to the systems affected by the interference because it allows them to undertake profiling of the interferer's propagation channel as seen by the affected SS. Cognitive Radio algorithms controlling adaptive antennas can be used to minimize the interference, for example, without invoking the coexistence protocols using such information.

The incidence of received BSD messages from a specific Base Station can be used as a measure of the interference intensity, indicating to the affected system whether coexistence action should be taken. The number of BSD detection events per Tcxcc cycle allows such counts. Sporadic interference can be identified by such means. The threshold for detection of such interference can be set with BS_CCID_RSP messages (6.3.2.3.68).

BSDs are randomly positioned inside the CX_CMI_D(n) slot in order to mitigate collisions with other BSDs that may be have been chosen in adjacent coexistence communities using a procedure detailed in 15.3.2.1.

There are three ways of generating the BSD.

Case - 1: CMI sub-frame has a preamble (REF1 and REF2) preceded by a CP (mandatory fixed cyclic prefix) CMI sub-frame has frame prefix (Frame control header- FCH) with known modulation - BSPK-1/2 with a ones symbol duration. FCH consists of Downlink frame prefix (DLFP), which in turn consists of the location and profile of the first four-downlink burst. The BS sends profile information of BSD in the DLFP only.

Case - 2: The BSD) can have a DL-MAP in the DLFP of CMI, where the DLFP located in FCH of CMI, this DL-MAP specifies the location, duration and profile of BSD in that CMI

Case - 3: A known modulation scheme QPSK-1/2 can be used for BSD transmission and can always start after preamble. Duration (symbol duration) of the BSD needs to be specified in a predefined place inside the message. In this case if start of the CMI frame is considered to be a predetermined one, time for parsing the BSD would be minimized. But if BSD needs to be sent in any position of CMI, then Case -2 or, case 1 are the choices.

References

[1] IEEE P802.16h/D1: *Air Interface for Fixed Broadband Wireless Access Systems Improved Coexistence Mechanisms for License-Exempt Operation*, Draft Standard.