

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Changes to the Sections 6.3.2.3.63 Re:Subscriber Station Uplink Radio Frequency (SSURF) message	
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Re:	Changes to Draft Standard	
Abstract	Editorial changes with addition of new content derived from comments. New section added as 15.3.2.5 which was taken for old section 6.3.2.3.63	
Purpose	Add consistency and clarity to draft document.	
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Changes to the Sections 6.3.2.3.63 Re: Subscriber Station Uplink Radio Frequency (SSURF) message

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Introduction

Sections 6.3.2.3.63 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. A new section 15.2.3.5 is added as well.

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.

Make the following changes to Section 6.3.2.3.63 located between line 1 and line 34 of page 10 of [1].

6.3.2.3.63 Subscriber Station Uplink Radio Frequency (SSURF) message

The Subscriber Station uplink radio frequency (SSURF) message is the complement to the BSD message except it is sent on the uplink during the CMI interval claimed by the Base Station to which the SS is registered.

This message, if received by foreign (interfered-with) Base Stations, will identify the SS as being an interferer ([15.3.2.5](#)).

A SSURF message shall include the following parameters to identify a subscriber station:

SS ID: Subscriber station identifier, in the context of this message, identifies the transmitting SS. This SS is the source of co-channel interferences reported in this message.

BS ID: Serving Base Station associated with the SS.

~~**BS 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 IP_Proxy address information: The BS IP address information uniquely identifies an associated base station. The encoding of this field is given above in TLV format.

BS EIRP: The BS EIRP It is signed in units of 1 dBm. The EIRP at which the SSURF message was sent; usually the maximum allowable EIRP for the operation of this station.

BS_RF_Sector_ID: The RF antenna sector ID is used to identify the RF transmitting antenna at the subscriber station. It contains information about the azimuth direction (with respect to True North) and -3 dB azimuth beamwidth of the antenna pattern transmitting the SSURF.

Make the following table located in Section 6.3.2.3.63 between line 34 and line 50 of page 10 of [1].

Table 108ab—SSURF message format

Syntax	Size	Notes
SSURF_Message_Format () {		
Management Message Type =68	8 bits	
SSID	8 bits	
BSID	48 bits	Associated base station identifier
BS RF antenna sector ID <u>BS_RF_Sector ID</u>	8 <u>16</u> bits	<u>Bits 0-7 For Azimuth of beam wrt true north, 2 degree steps</u> <u>Bits 8-15 for -3db Azimuth Beamwidth , 2 degree steps.</u>
<u>BS EIRP</u>	<u>8 bits</u>	<u>dBm</u>
BS IP Proxy_Address_IE()	Variable	
}		

Delete the material found in between line 51 on page 10 and line5 on page 11 of the current working document [1]

Insert the following as Section 15.3.2.5 directly above the current Section 15.3.3 located on Page 78 of [1].

15.3.2.5 Interference Messaging: Subscriber Station Uplink Radio Frequency (SSURF) Message

Subscriber Station Uplink RF (SSURF) messages are the primary means by which a system defines the extent of the interference caused by its subscriber stations to neighboring base stations and coexistence community members. It is demodulated and effectively sensed by the affected base stations. The message is sent on a periodic basis when requested to by the Base Station and over a number of Tcxcc cycles, depending on the number of SS the BS controls, all of the SS should have an opportunity to transmit SSURF messages. When received as interference at foreign base stations, the demodulated SSURF provides that station with its specific identity and the proxy IP address of the BS controlling it.

The monitoring process for foreign interfering SSURF messages is undertaken by the Base Station. A BS (system n) will monitor CX_CMI_U(n-1) and CX_CMI_U(n+1) in a system where n=3 (max). The BS also monitors its own CX_CMI_U(n), but only for foreign SSURF from co-channel systems that have claimed the same slot. Under most circumstances this should not occur since the IBS undergoes an extensive CMI claiming procedure (15.3.2.3), however, there is always the possibility of sporadic interference which must be identified. To facilitate such detection the CX_CMI_U(n) slot is never fully occupied with desired SSURF messages in order to allow the opportunity for other foreign SSURFs to be detected without collision.

The SSURF message also contains the EIRP at which it was sent. This is done to allow interfered-with BS to apply propagation channel estimation algorithms and other techniques which may be able to resolve specific interference without resorting to the CXP.

To send a SSURF message by a SS a UL-MAP message needs to be sent with an uplink CXZ IE (extended UIUC = 0x015) by the operating BS (OBS) (SS is registered with that BS), where the allocation start time in UL-MAP will be the start of the next CMI - uplink sub frame. These uplink grants for sending SSURF are unicast to SS. SS sends the SSURF by using this grant in CMI frame. A long preamble needs to be added before the SSURF message. Here the preamble preceding to the SSURF also uses a predefined CP.

Any interfered-with BS (n) while in listen mode on CX_CMI_U(n+/-1), if detecting any preamble (REF1 and REF2), by using a predefined CP (cyclic prefix), and by using a predefined modulation QPSK1/2, will detect the SSURF.

Along with a preamble, the SS can add a FCH before SSURF. Inside the FCH it could defines the profile of SSURF, so that BS in listen mode (duration of others CMI) while operating in control channel establishment decode the FCH to get the profile info of SSURF, and decode it accordingly.

References

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