

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Changes to clause “Network - based identification of specific spectrum services”	
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Re:	LB 29	
Abstract	The document is a proposal for profiles based on the poll taken in November 2007 meeting, in relation with comment 092 in database IEEE 802.16/07-53r2	
Purpose	[Description of what <i>specific</i> action is requested of the 802.16 Working Group or subgroup.]	
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Changes to clause “Network - based identification of specific spectrum services”

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Introduction

In response to comments addressing the existence of the IP messages in the 802.16h Draft P802.16h/D4, are needed also a number of changes to the Networking approach in clause 15.8. The full concept shall include always a 802.16 entity, such that the RAIS shall communicate directly to a BS, and not using the BSIS as intermediate. Any text related to the BSIS was deleted (including some Token-related text).

Text changes

15.8 Network - based identification of specific spectrum services or applications

Overview

The method described below allows identifying specific (protected) spectrum users based on their GPS coordinates and the geographic protection area, as defined by the national regulations. Such spectrum users, during their activity period at a specific location, register themselves with a database of the National Radio Administration and indicated the range of used frequencies and the requested time intervals for protection. The registration can use a WEB application, above the scope of this document.

BWA Base Stations register themselves with the same data-base. The list of the provided attributes should include the following elements:

- GPS location
- Network address
- Tx power
- List including N structures for N channels as described below:
- Center frequency of the transmit channel i (both FDD and TDD);
- Channel width of channel i;
- ACLR (Adjacent Channel Leakage Ratio)
- ACLR in the 2nd adjacent channel
- Center frequency of the receive channel j, if FDD is used
- Bandwidth of channel j
- Antenna type and direction
- Noise power

The list of the parameters to be provided by the SSU should include:

- Radio application identification
- GPS location of the center of the protection area (not necessarily the GPS location of its operation)
- Required radius of the protection area (optional)
- Tx power
- List including N structures for N channels as described below:
- Center frequency of the transmit channel i (both FDD and TDD);
- Channel width of channel i;
- ACLR of channel i
- ACLR in the 2nd adjacent channel to channel i
- Center frequency of the receive channel j, if FDD is used
- Bandwidth of channel j;
- Antenna type and direction
- Noise power
- Date and absolute time of requested operation start
- Duration of operation; for backhaul-less systems the duration will be max. [4] hours. In case of longer operation, the spectrum request shall be renewed.

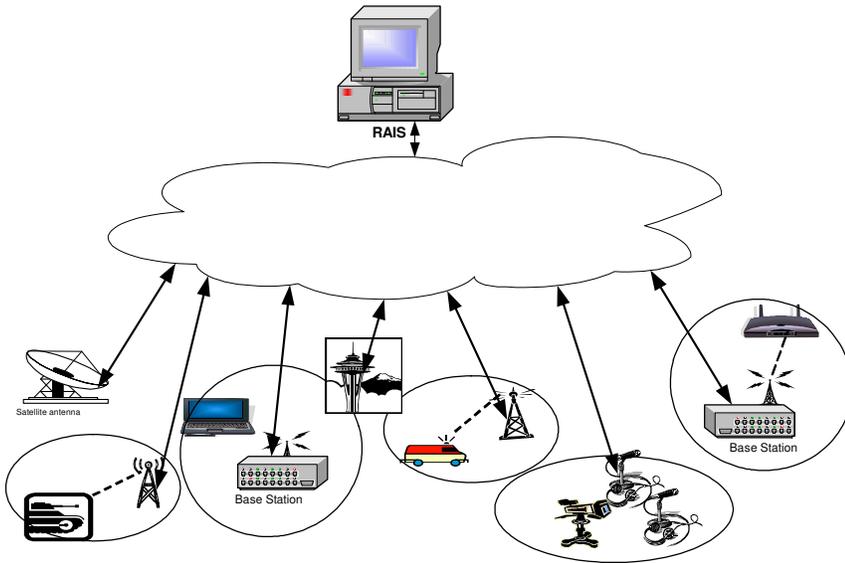
A special application, running on the Radio Administration Server, should identify the limitations imposed to the BWA applications, regarding the:

- operating frequency channels
- transmit power
- time constraints.

~~The National Radio Administration (NRA) uses secure IP communication with the Base Station Identification Servers operating on its territory and provides them with the information needed to protect the operation of the protected users. However, the BWA services may also be affected by the transmitters of the protected applications. This method includes provisions for evaluating the interference which may be caused by the other applications to the BWA services. The BSIS sends the information to the Base Stations, which will select accordingly the operating frequencies and the used transmission powers.~~

Architecture

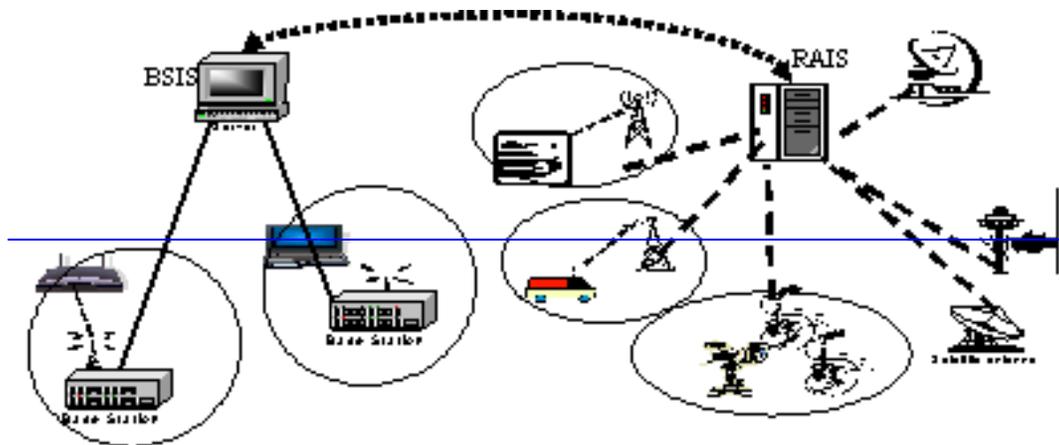
The proposed architecture uses ~~different servers for the BWA systems and the systems to be protected, namely the BSIS (Base Station Identification Server) for the BWA systems and~~ the RAIS (Radio Application Identification Server) for the devices providing specific radio applications. Generally the ~~BSIS will be maintained by a Service Provider and the~~ RAIS will be provided by the National Radio Administration. The communication of the BS with ~~the BSIS or of the specific radio devices with~~ the RAIS is secured by VPN or other procedures.



Architecture for coexistence of BWA and preferred radio applications Figure h-65 gives an example of the proposed architecture. The BSIS are connected to the Base Stations providing BWA services. The RAIS has connections with the BWA Base Stations, but also with Base Stations providing TV applications, Satellite applications, Military applications, Health applications, Security applications, etc. ~~In all these cases secure communication shall be established between the RAIS and the Base Stations or the Service Providers providing these services.~~

A special class is are the Ad-Hoc protected applications, as wireless microphones or TV vehicle transmissions, which are mobile ad-hoc protected applications. In this situation a secure communication will be established between a Laptop with cellular interface or a hand-held device and the RAIS.

~~In addition to these functions, this architecture can also serve for the administration of the credit tokens to be used for the CT-CXP operations. For that purpose, RAIS can specify to BSISs some policies (ruling) for the usage of the credit tokens for the BS covered by this BSIS. For example, policies can specify the number of credit tokens to be assigned to each BS at some given locations or some given time periods, the negotiation mode, the pricing method, and so forth. The BSIS communication with RAIS is supported by the Coexistence Protocol messages Regulatory Authority Request and Regulatory Authority Response.~~



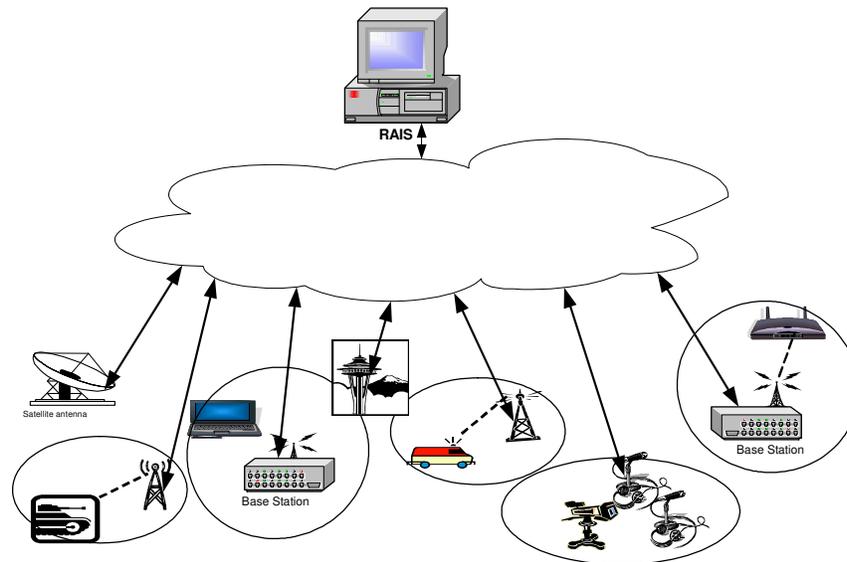


Figure h65—Architecture for coexistence of BWA and preferred radio applications

Operation

~~Any special Radio Application should inform the RAIS about the following:~~

- Radio application identification
- GPS location of the center of the protection area (not necessarily the GPS location of its operation)
- Required radius of the protection area (optional)
- Tx power
- List including N structures for N channels as described below:
 - Center frequency of the transmit channel i (both FDD and TDD);
 - Channel width of channel i ;
 - ACLR of channel i
 - ACLR in the 2nd adjacent channel to channel i
 - Center frequency of the receive channel j , if FDD is used
 - Bandwidth of channel j ;
 - Antenna type and direction
- Date and absolute time of requested operation start
- Duration of operation; for backhaul-less systems the duration will be max. [4] hours. In case of longer operation, the spectrum request shall be renewed.

~~The information should be securely transmitted to the operator-specific BSIS. For military users etc., the protection area may be recommended, without giving the exact information of their location. The BSISs contain the GPS coordinates of the deployed Base Stations and their cell sizes. A special program will establish which systems shall change the operating frequencies.~~

~~When a change of the spectrum usage or an up-date is necessary, the RAIS will send the C-CX-FREQ-AVOIDANCE-REQ Special messages primitive are sent~~ to the affected BSs with the request to change the operating frequency (~~FREQ_AVOIDANCE~~) and eventually with a recommendation for the new operating frequencies. From this moment all the operators in the frequency range will share the available spectrum, following procedures to be agreed or those defined by WirelessMAN-CX.

The BSIS will inform the RAIS about the availability of the requested spectrum if frequency channel, by using the primitive C-CX-FREQ-AVOIDANCE-RSP. ~~n the moment that all the affected Base Station entered in stable operation using the new frequencies.~~

~~The BSIS communication with RAIS is supported by the Coexistence Protocol messages Regulatory Authority Request and Regulatory Authority Response. The BSIS communication with the Base Stations is supported by the CXP messages FREQ_AVOIDANCE Request and FREQ_AVOIDANCE Response.~~