

**ITU-R SG 1/WP 1B WORKSHOP:
SPECTRUM MANAGEMENT ISSUES ON
THE USE OF WHITE SPACES BY
COGNITIVE RADIO SYSTEMS
(Geneva, 20 January 2014)**

**Cognitive Radio Systems.
Principles of coordination
in the border areas**

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COGNITIVE RADIO SYSTEMS

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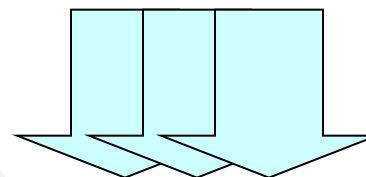
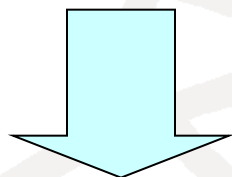
Regional Commonwealth in the field of communications



Regional Commonwealth in the field of communications

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The RCC Commission on regulation of the use of radio frequency spectrum and satellite orbits.

Other RCC Commissions



Working group on preparation for WRC-15 and RA-15

Broadcasting Working Group

Spectrum Management Working Group



Principle 1

An administration should take a decision aiming at establishing a national geolocation database.



Principle 2

The concerned administrations should conclude agreements on cross-border coordination relating to the cognitive radio systems.

The administrations are in the position to choose one of the three ways to use cognitive radio systems in the border areas.



There are three ways to use cognitive systems in the border areas:

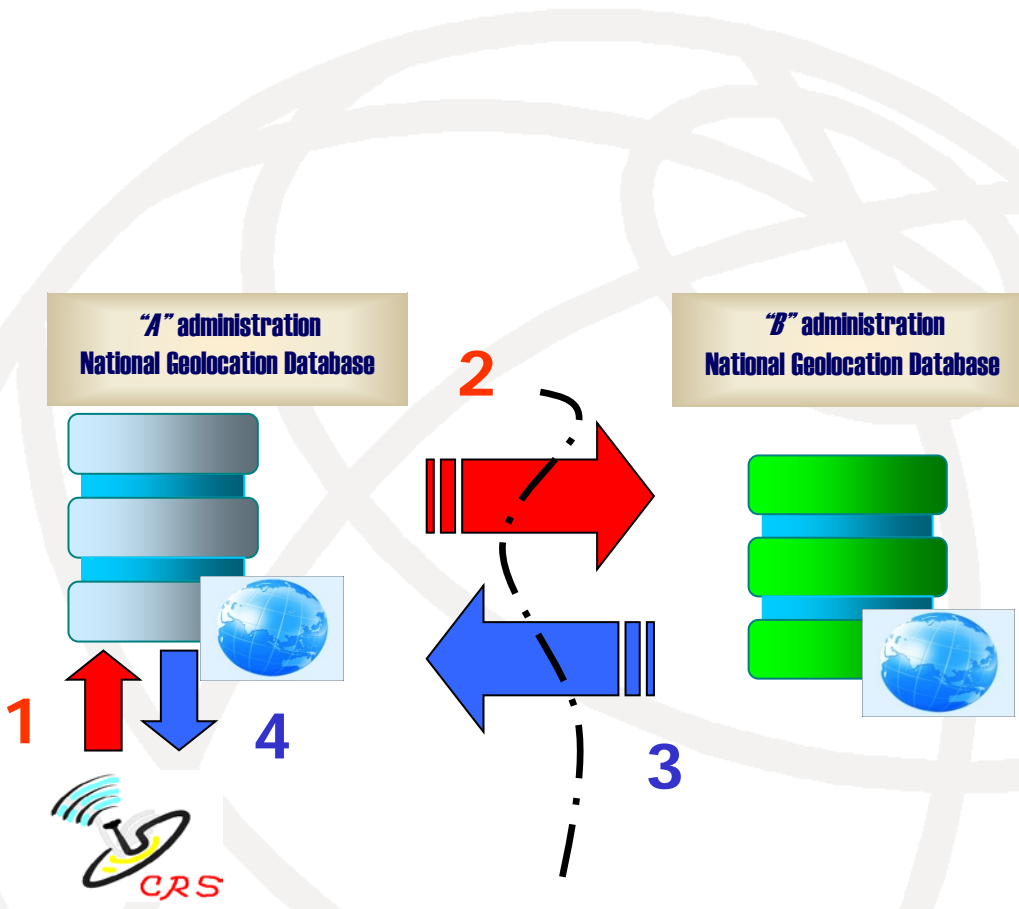
- An administration adds technical restrictions, imposed by a neighboring country on the use of radio frequencies by cognitive systems, to the national geolocation database.
- The administrations should arrange interaction among the national geolocation databases to determine a possibility for using cognitive radio devices in the border areas.
- The administrations establish a sharable geolocation database of protected radio devices for cross-border coordination of cognitive systems.

Technical Restrictions



- A cross-border coordination Agreement sets technical restrictions on values of the field strength in the border area, the signal power of cognitive systems or the information on restricted channels.
- These restrictions are added to the national geolocation database and are taken into account while processing a request coming from a cognitive radio system.
- **A Use-Case**
An "A" administration has decided to allocate frequency bands for cognitive radio systems and has established a national geolocation database. A "B" administration has not taken the corresponding decision.

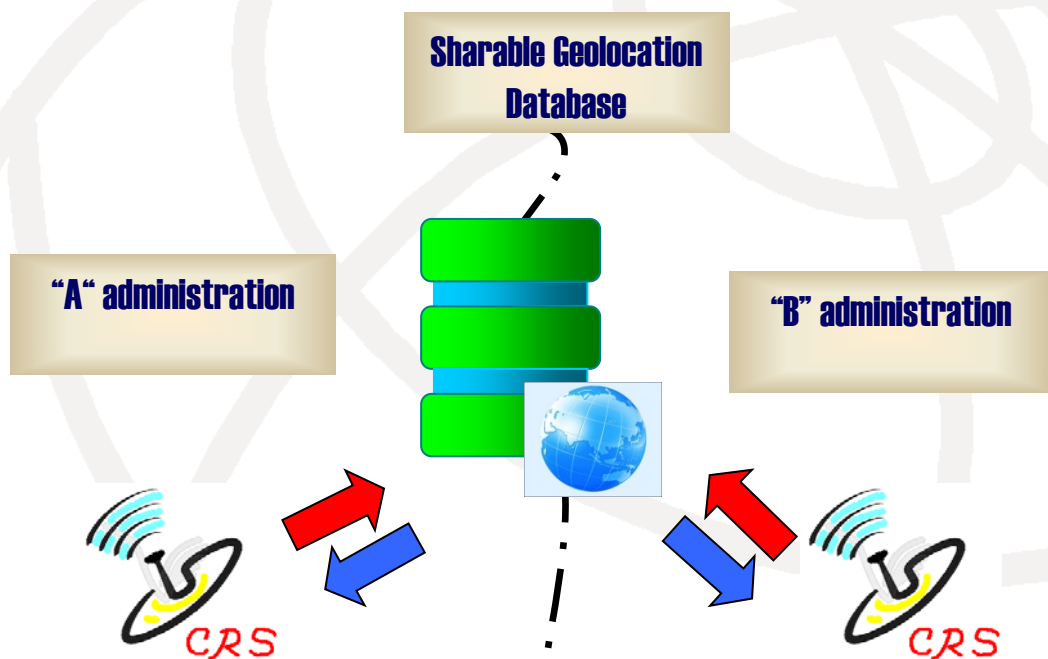
Interaction among National Geolocation Databases:



A Use-Case

1. A cognitive radio system (CRS) sends a request to the national geolocation database of the "A" administration.
2. One national geolocation database ("A" administration) sends a request to another national geolocation database ("B" administration).
3. The national geolocation database ("B" administration) forwards an automatic response to the request containing information about: (a) acceptance of the request; or (b) acceptance of the request subject to restriction of the CRS technical parameters; or (c) non-acceptance of the request.
4. The national geolocation database ("A" administration) sets an operation mode for CRS.

A Sharable Geolocation Database



Possible Solutions:

1. The administrations establish a sharable geolocation database for border areas. In this case the sharable database interacts with the national geolocation databases.

2. The administrations establish a sharable geolocation database for all the territory, which replaces the national geolocation databases.



Principle 3

The administrations should have equitable access to the spectrum.

Possible Solutions:

1. Preferential channel division among administrations.
2. Priority channel division among administrations. The cognitive radio systems have priority if using channels selected for their administrations.



Principles of coordination of cognitive radio systems in the border areas

(These principles were proposed by the Spectrum Management Working Group of the RCC)

Principle 1. An administration should take a decision aiming at establishing a national geolocation database.

Principle 2. The concerned administrations should conclude agreements on cross-border coordination relating to the cognitive radio systems. The administrations are in the position to choose one of the three ways to use cognitive radio systems in the border areas:

- An administration adds technical restrictions (on values of the field strength in the border area, the signal power of cognitive systems or the information on restricted channels), imposed by a neighboring country on the use of radio frequencies by cognitive systems, to the national geolocation database;
- The administrations should arrange interaction among the national geolocation databases to determine a possibility for using cognitive radio devices in the border areas;
- The administrations establish a sharable geolocation database of protected radio devices for cross-border coordination of cognitive systems.

Principle 3. Each administration shall have an equal access to the spectrum.



Thank you for your attention!

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