paws database architecture

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Reminder of basic need

- Nation independent
- Spectrum Band independent
- Phy/Mac independent

Example of how US TV Bands database works

- Database is provisioned with a set of "protected entity" records = primary users of spectrum
- In the U.S., there are 10 or so kinds of protected entities
- While most are transmitters, some are receivers
- Records contain location of transmitter/receiver, type of protected entity, …

Contours

- For each protected entity, a contour (polygon) is calculated
- Typical RF propagation algorithm, which takes into account height of antenna, and height of terrain between transmitter and receiver
- A buffer zone is added to this contour
- The result is a protected contour, within which white space devices cannot operate
- The contour is specific to a channel
- For some kinds of protected entities, both co-channel and adjacent channel protection is given

Database query

- White Space Devices query the database with it's location (and in the U.S., type: fixed or personal/portable).

- The location of the WSD is intersected with each contour

- For any contour which the WSD is within, the associated channel is not available

- The list of channels left is returned to the WSD. It can operate on any of them.

Handling Nation Independence

- DB discovery has to be location sensitive

- Possible use of LoST

- Rules for creating contours from protected entity data has to be nation specific

Handling Spectrum Band Independence

- Obvious connection to Nation

- DB discovery may have to be spectrum dependent

- Need a notion of a part of a band = channel, but there may not be formal channels in some bands

Handling Mac/Phy independence

- Query is L7 (probably HTTP based)
- Query does not have any phy/mac dependence: location + type in, allowed spectrum choices out

Inter-DB sync

- In US, multiple competing DBs in TV Bands
- Operators of DBs must interchange protected entity data
- Each DB computes contours and handles queries
- Inter-DB sync protocol will probably be standardized
- Currently out of scope for paws