Data Model In Support of White Space Database Access Protocols

draft-caulfield-paws-protocol-for-tvws-01

Taipei, November 15, 2011
Challenge and Needs

- How to enable a standardized, lightweight and Rules-compliant Whitespace implementation

- Desirable features
  - Maximally leverage existing standards and technologies
    - Only invent (or extend) what you have to
  - Support in TV and other future bands
  - Support for capability extensions like coexistence
  - One data model for many use cases
Our Approach and Proposal

- Develop a data model that
  - Supports current FCC requirements
  - Accommodates currently described use cases
  - Anticipates expected international Rules
  - Can be implemented today

- Contribute to the community for further improvement
  - Consider broader use cases
  - Focus on internationalization
  - Path to standardization
About the Data Model

What is it?

- A Data Model
- A commercial specification
- Published and freely available
- Describes all aspects of a generalized wireless service
  - Broadcast only stations
  - Receive only stations
  - Point to point
  - Point to multi-point
  - Many-to-many (Full and partial mesh)
  - Etc.
- Supports all aspects of US white space implementation

What it is Not

- NOT a protocol
- NOT a white space database
- Not a formal standard
  (It is a commercial specification)
- Not finalized
  (Mature but not final)
- Does not specify a security strategy
White Spaces Background and Primer

- Television Broadcast frequencies (VHF and UHF)
- Two classes of unlicensed white space device are envisioned
  1. Those that create a network (e.g. access points)
  2. Those that consume a network (e.g. clients)
- Three modes of unlicensed operation are described

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Access Points</th>
<th>Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Fixed</em></td>
<td><em>Mode II</em></td>
<td><em>Mode I</em></td>
</tr>
<tr>
<td>Permanently installed</td>
<td>Transportable and/or Limited mobile</td>
<td>Mobile</td>
</tr>
</tbody>
</table>

![Diagram of telecommunication devices]
Reusable Object Model Hierarchy

Station
- Antenna
  - Radiation Pattern
- Channel(s)
- Contact(s)
- License(s)
- Location
- Schedule
- Transmitter(s)
- Address
- Coordinate
- Geometry
- Geometry
- Polygon
- Envelope

New Definition

Standards Based
Format for White Space Messaging
Example Geometries

**POINT**

**POLYGON**

**LINE**