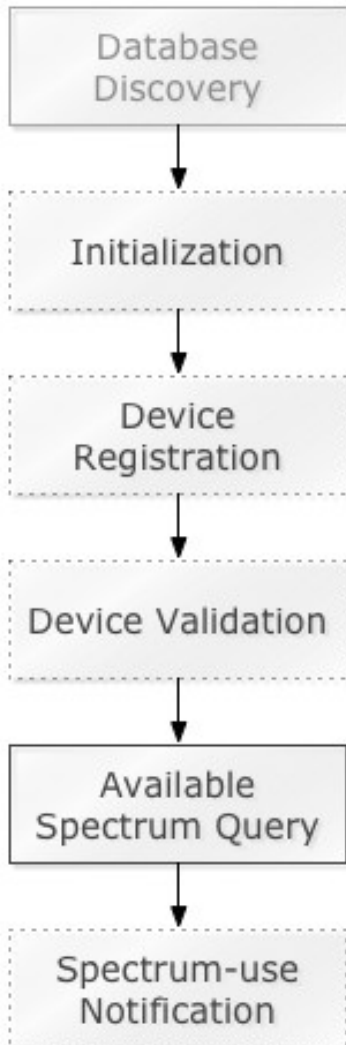


Outline

- Status of the PAWS protocol document: -12
 - Submitted to IESG for Publication
 - On agenda of 2014-08-07 IESG telechat
- Summary: Suggested changes from reviewers
- Open Items
 - Use of the term “parameter”
 - Protocol requirements in Extensions
 - Description of JSON messages (schema)
 - Is Listing Server protocol out of scope?

Protocol Overview



- Database Discovery
- Initialization
 - Initial handshake: Exchange capability info
 - Optional for device, DB must implement
- Device Registration
 - Regulator-specific (e.g., not all regulators)
- Device Validation
 - Validation of slave devices by master devices asking database
 - Regulator-specific
- Available Spectrum Query
- Spectrum-use Notification
 - Regulator-specific

Suggested Changes for Draft -13

- Consistency with RFC2119
- Define PAWS version “major.minor”
 - Change minor if add new request/responses. Change major if incompatible.
- Define primitive types for UML-like diagrams; strings are UTF-8
- Define ruleset vs ruleset ID
- HTTP 301 (Moved permanently):
 - SHOULD use DbUpdateSpec before URI change, but 301 allowed after
- Further separation of regulatory from protocol requirements
- IANA section: remove process, use paws@ietf.org

Open Item: Inconsistent Use of “parameter”

- Refers to “structures” (e.g., GeoLocation) and “fields” (e.g., “point”)
- Alternate names for “structures” case:
 - “structure”
 - “object” a la JSON
- To avoid confusion, change “field” to “parameter”

Open Item: Protocol Requirements for Extensions

- Example: For the FCC ruleset, “fccId” is mandatory
 - Should this be “REQUIRED” or “required”?
- Example: For the ETSI ruleset, “etsiEnTechnologyId” is mandatory
 - ETSI does not specify a max length, but the protocol should, so should this be “MUST NOT exceed 64 octets”?

Open Item: Describing JSON without schema

```
{
  "name": "INIT_REQ",
  "type": "object",
  "properties": {
    "type": "INIT_REQ",
    "version": {
      "type": "string",
      "required": true
    },
    "deviceDesc": {
      "type": "DeviceDescriptor",
      "required": true
    },
    "location": {
      "type": "GeoLocation",
      "description": "The location of the Device's antenna. Some rulesets mandate this to Be the Device's current location; others allow it to be an anticipated position of the Device.",
      "required": true
    }
  }
}
```

- Issue: draft-zyp-json-schema that describes schema format has expired
- Alternatives:
 - By example
 - draft-newton-json-content-rules
 - RFC 7071, Section 6.2

Proposal 1: Describe JSON by Example

```
{
  "type": "INIT_REQ",
  "version": "1.0",
  "deviceDesc": { /* DeviceDescriptor */},
  "location": { /* GeoLocation */}
}

/* DeviceDescriptor */
{
  "serialNumber": "ABD1234",
  "manufacturerId": "ACME",
  "modelId": "WS45930",
  "rulesetIds": [
    "FccTvBandWhiteSpace-2010"
  ]
}

/* GeoLocation
  - point and region mutually exclusive
*/
{
  "point": { /* Ellipse */},
  "region" { /* Polygon */},
  "confidence": 95
}
```

- Complete examples might be verbose
- For description and whether a member is required, etc. refer back to UML diagram and descriptions in Section 4 and 5

Proposal 2: Describe JSON using draft-newton

```
version "version" : string /\d+\.\d+/
```

```
DeviceDescriptor {  
  ; comments start with semi-colon  
  "serialNumber": string,  
  
  ; question mark indicate optional  
  ?"manufacturerId": string,  
  ?"modelId": string,  
  
  ; min/max array sizes use: n*m  
  ?"rulesetIds": [ 1* : string ]  
}
```

```
GeoLocation {  
  ; Use '/' for choice  
  "point" Ellipse / "region" Polygon,  
  ; numeric bounds use: n..m  
  ?"confidence": integer 0..100  
}
```

```
root {  
  "type": "INIT_REQ",  
  version,  
  "deviceDesc" DeviceDescriptor,  
  "location" GeoLocation  
}
```

- Supports “object rules” that allow nested definitions
- Has notation to represent:
 - Optional members
 - Cardinality
 - Numeric bounds
- Does not have notation to limit length of strings
- Issue: It's only a draft; would be blocker for PAWS

Proposal 3: Describe JSON using RFC 7071, Section 6.2

version-string: a MEMBER with MEMBER-NAME "version" and MEMBER-VALUE a STRING of the form "major.minor" where major and minor are integers

DeviceDescriptor-object: an OBJECT, where each MEMBER is a DeviceDescriptor-element

DeviceDescriptor-element: one of the following: serialNumber-string, manufacturerId-string, modelId-string, rulesetIds-list; note the following:

- * The order of DeviceDescriptor-element members is not significant
- * A specific DeviceDescriptor-element MUST NOT appear more than once
- * serialNumber-string is REQUIRED

serialNumber-string: a MEMBER with MEMBER-NAME "serialNumber" and MEMBER-VALUE a STRING

manufacturerId-string: a MEMBER with MEMBER-NAME "manufacturerId" and MEMBER-VALUE a STRING

- Fairly verbose
- May not be well suited to complex, nested structure of PAWS messages

Open Item: Listing-server protocol

- Options
 - Define the protocol
 - Declare protocol is out of scope
 - Removing discussion of Listing-server behavior entirely

Proposal: Listing-server protocol

- URI of Listing Server for a regulatory domain is preconfigured
- Response is of the form:

```
{
  "lastUpdateTime": "2014-06-18T10:00:00Z",  /* RFC3339 format */
  "refreshIntervalMinutes": 1440,
  "dbs": [
    {
      "name": "Some DB name",
      "uri": "https://some.db.address",
      "id": 132  /* optional numeric ID */
    },
    {
      "name": "Other DB name",
      "uri": "https://other.db.address",
      "id": 3  /* optional numeric ID */
    },
    ...
  ]
}
```

- Matches Ofcom-defined structure, except Ofcom uses XML
 - Reference: <https://twws-databases.ofcom.org.uk/weblist.xml>

Proposal 2: Describe JSON using draft-newton

```
version "version" : string /\d+\.\d+/
```

```
DeviceDescriptor {  
  ; comments start with semi-colon  
  "serialNumber": string,  
  
  ; question mark indicate optional  
  ?"manufacturerId": string,  
  ?"modelId": string,  
  
  ; min/max array sizes use: n*m  
  ?"rulesetIds": [ 1* : string ]  
}
```

```
GeoLocation {  
  ; Use '/' for choice  
  "point" Ellipse / "region" Polygon,  
  ; numeric bounds use: n..m  
  ?"confidence": integer 0..100  
}
```

```
root {  
  "type": "INIT_REQ",  
  version,  
  "deviceDesc" DeviceDescriptor,  
  "location" GeoLocation  
}
```

- Supports “object rules” that allow nested definitions
- Has notation to represent:
 - Optional members
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