



**Operations for Citizens Broadband Radio  
Service (CBRS):  
Priority Access License (PAL) Database  
Technical Specification**

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# Operations for Citizens Broadband Radio Service (CBRS): Priority Access License (PAL) Database Technical Specification

## 1 Introduction

This document specifies the Priority Access License (PAL) Database schema as per requirement (R2-SPU-03) [N.1]. The PAL Database is populated and maintained through cooperation between SAS Administrators. The Database represents the results of PAL auctions for the purposes of vetting a PAL Protection Area (PPA) claim, creating a PPA-ID, and approving CBSD spectrum grant requests under those licenses. In addition, the PAL Database records the results of agreements for PAL channel assignments, and when possible, the evolution of those agreements within each county when incumbent activity affects specific frequency allocations.

## 2 References

### 2.1 Normative references

- [N.1]. “Requirements for Commercial Operation in the U.S. 3550-3700 MHz Citizens Broadband Radio Service Band”, Wireless Innovation Forum Technical Specification WINNF-TS-0112, v1.1.0.
- [N.2]. “The application/json Media Type for JavaScript Object Notation (JSON)” RFC 4627.
- [N.3]. “Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS); Spectrum Access System (SAS) – SAS Interface Technical Specification”, Wireless Innovation Forum Technical Specification WINNF-TS-0096, v1.0.0.
- [N.4]. “Signaling Protocol and Procedures for Citizens Broadband Radio Service (CBRS); Spectrum Access System (SAS) to Citizens Broadband Radio Service Device (CBSD) Interface Technical Specification”, Wireless Innovation Forum Technical Specification WINNF-TS-0016, v1.0.0.
- [N.5]. Electronic Code of Federal Regulations, Title 47, Chapter I, Subchapter D, Part 96, <http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=0076fe7586178336d9db4c5146da8797&mc=true&n=pt47.5.96&r=PART&ty=HTML>.
- [N.6]. [RFC-3339](#), "Date and Time on the Internet: Timestamps", Klyne, Newman, July 2002.
- [N.7]. Auction 105 - 3.5 GHz: Auction Data - Results by License, [https://auctiondata.fcc.gov/public/projects/auction105/reports/results\\_by\\_license](https://auctiondata.fcc.gov/public/projects/auction105/reports/results_by_license)

## 3 Definitions and Abbreviations

### 3.1 Definitions

See [N.1] for definitions of terms used in this document.

### 3.2 Acronyms

Abbreviation	Description
CBSD	Citizens Broadband Radio Service Device
FCC	Federal Communications Commission
FRN	FCC Registration Number
HTTPS	Secure HTTP (e.g. with TLS)
JSON	Javascript Object Notation
PAL	Priority Access License
PPA	PAL Protection Area
SAS	Spectrum Access System

## 4 PAL Database Creation and Use

SAS Administrators shall engage in a reconciliation of the outcomes of FCC auctions and other actions resulting in PALs being issued to licensees within the CBRS band. This process shall consolidate information about the auctions from the FCC, and subsequently construct or update the PAL Database following any relevant activity (including any needed error resolution) around the state of a PAL, such as issuance, termination, or sale.

### 4.1 PAL Auction Results

This specification uses information in the official results of PAL auction issued by the FCC [N.7], including the license ID, the licensee (referenced by name and FRN) and the geographical area (a county) of the PAL license.

### 4.2 PAL Channel Assignment

All SASs shall utilize identical quasi-stable channel assignments for CBSDs exercising their PAL rights. The physical channel assigned to a PAL license is included in the *primaryAssignment* field in the database as specified in Section 6.1.3.

### 4.3 Use of the PAL Database

SAS Administrators shall ensure their own SASs are synchronized with the PAL Database on a daily basis. SAS Administrators shall make use of the PAL Database to perform verification

of PAL holder rights to the relevant license areas during the separate process for registering PAL Protection Areas (PPAs) [See N.1, R2-SPU-04], and to make consistent channel assignments to CBSDs in the cluster list of that PPA [See N.1, R2-SPU-09].

#### 4.4 Leasing information in the PAL Database

Reflection in the PAL Database of any leasing arrangements made by Priority Access Licensees is for future study, subject to the requirements in [N.1].

### 5 Record Encoding for the PAL Database

The records in the PAL Database shall be encoded using JSON (JavaScript Object Notation), a widely accepted network data representation and exchange protocol. JSON encoded data is in the form of human readable single or multiple of “name”/“value” pair(s), where the “name” is typically a self-descriptive unique string tag identifying the information to be represented and the “value” is the information to be carried [N.2]. JSON allows a “value” be one of the four primitive types (respectively, string, number, boolean and null) and two structured types (JSON object and array). Brief definitions of all above primitive and structured data types are as follows:

- String: a readable string begins and ends with double quotation marks. All Unicode characters can be placed within the quotation marks. Double quotation mark, backslash and control characters must be preceded by an escape character (\ i.e. backslash).
- Number: a signed integer or a floating number. A floating number can be represented using regular decimal format or scientific exponential format.
- Boolean: a Boolean value this indicates either true or false.
- Null: a null value representation of the value of a string or an object or an array type when the required value is not available.
- Object: A self-contained JSON object enclosed in a pair of curly brackets.
- Array: a value array of any one of the String, number, boolean, object and array types, enclosed by square brackets.

An example of a JSON representation of a PAL Database record is as follows:

```
{
  "palId" : "PL-D01001-P1",
  "licensee" : "CBSD Operator No.1",
  "userId" : "23456789",
  "registrationInformation" : {
    "frn" : "23456789",
    "registrationDate": "2017-06-01",
  },
  "license": {
    "licenseId": "fccId123456789-1",
    "licenseDate": "2017-07-01T00:00:00Z",
    "licenseExpiration": "2031-03-01T00:00:00Z",
    "licenseAreaIdentifier": "01001",
    "licenseAreaExtent": "zone/county/census/2010/01001",
    "licenseFrequencyChannelId": "1"
  },
  "licenseStatus": "VALID",
  "channelAssignment": {
    "primaryAssignment": {
      "lowFrequency": 3550000000,
      "highFrequency": 3560000000
    },
    "secondaryAssignment": {
      "lowFrequency": 3580000000,
      "highFrequency": 3590000000
    }
  }
}
```

## 5.1 PAL Database Records

For convenient sharing of the PAL Database among SAS Administrators, it will be represented as a set of files each containing a JSON list of records following the schema of PAL Database Info Records (see 6.1):

**Table 1: PAL Database file contents**

Data Type	Field Definition
List of object: <i>PalInfoRecord</i>	A PAL Database file contains a list of PAL Database Info Records.

## 6 PAL Database Schema Definition

This section contains detailed field-by-field specifications for PAL Database Info records. Each field is indicated as “Required” or “Optional”. The definitions of these indicators are as follows:

**“Required”:** The field shall always be included in a PAL Database Info record.

**“Optional”:** The field may be included in a PAL Database Info record. SAS is not expected to use the field.

The tables of fields in this section have a column marked “R/O” that indicates whether a particular field is required or optional.

## 6.1 PAL Database Info Record

Table 2: *PalInfoRecord* object

Field	R/O	Field Definition
NAME: <i>palId</i> DATA TYPE: <i>string</i>	Required	This parameter is the license ID of the PAL license that this record corresponds to, as defined in the FCC PAL auction results [N.7].
NAME: <i>licensee</i> DATA TYPE: <i>string</i>	Required	Human-readable name of the PAL licensee
NAME: <i>userId</i> DATA TYPE: <i>string</i>	Required	By default, this string represents the User Registration Identifier (UR-ID) of the Priority Access Licensee, which is used by CBSDs requesting PAL spectrum grants from SAS to identify which Priority Access Licensee they are operated by. Alternatively, a globally unique identifier different from UR-ID for a Priority Access Licensee may also be used in this field. In this case, the SAS shall associate the value of this field with UR-ID of Priority Access Licensee in order to determine the PAL right of CBSDs. An example of such globally unique identifier is the FRN of the PAL Licensee. For PAL commercial operation, the global unique identifier will be used in the database.
NAME: <i>registrationInformation</i> DATA TYPE: object: <i>RegistrationInformation</i>	Required	Contains various extensible registration information for the PAL licensee
NAME: <i>license</i> DATA TYPE: object: <i>LicenseInformation</i>	Required	Information regarding the license described in this PAL database record
NAME: <i>licenseStatus</i>	Optional	If included, the value is “VALID”.



DATA TYPE: <i>string</i>		
NAME: <i>channelAssignment</i> DATA TYPE: object: <i>ChannelAssignment</i>	Required	The consistent channel assignment information for this PAL.

### 6.1.1 RegistrationInformation object

**Table 3: RegistrationInformation object**

Field	R/O	Field Definition
NAME: <i>frn</i> DATA TYPE: <i>string</i>	Required	The FRN of the licensee
NAME: <i>registrationDate</i> DATA TYPE: <i>string</i>	Optional	Date of licensee FCC registration. It is expressed using the format, YYYY-MM-DDThh:mm:ssZ, as defined by [N.6].
NAME: <i>licenseConditions</i> DATA TYPE: <i>string</i>	Optional	Human-readable string or reference annotating the certification
NAME: <i>callSign</i> DATA TYPE: <i>string</i>	Optional	The call sign of the licensee (as assigned by FCC).

This object is extensible and other fields can be added to reflect more needed information about the PAL licensee as reflected in the FCC auction records and needed for SAS verification of PAL licensee identity.

### 6.1.2 LicenseInformation object

**Table 4: LicenseInformation object**

Field	R/O	Field Definition
NAME: <i>licenseId</i> DATA TYPE: <i>string</i>	Optional	The FCC-issued license ID.
NAME: <i>licenseDate</i> DATA TYPE: <i>string</i>	Optional	Date of the start of the license period. It is expressed in UTC using the format, YYYY-MM-DDThh:mm:ssZ, as defined by [N.6].
NAME: <i>licenseExpiration</i> DATA TYPE: <i>string</i>	Required	Date of license expiration. It is expressed in UTC using the format, YYYY-MM-DDThh:mm:ssZ, as defined by [N.6].

NAME: <i>licenseAreaIdentifier</i> DATA TYPE: <i>string</i>	Required	FIPS county code (a 5-digit number where the first two digits represent the state and the last three digits represent the county within the state)
NAME: <i>licenseAreaExtent</i> DATA TYPE: <i>string</i>	Required	Reference to a record in a geographical database represented as a SAS-SAS Zone record (See [N.3]) providing the extents of the license area. (e.g. “zone/county/census/\$YEAR/\$FIPS”)
NAME: <i>licenseFrequencyChannelId</i> DATA TYPE: <i>string</i>	Optional	The FCC-supplied identifier for the frequency channel for the PAL.

### 6.1.3 ChannelAssignment object:

**Table 5: ChannelAssignment object**

Field	R/O	Field Definition
NAME: <i>primaryAssignment</i> DATA TYPE: <i>object:FrequencyRange</i> (See [N.4])	Required	The primary channel allocation for this PAL.
NAME: <i>secondaryAssignment</i> DATA TYPE: <i>object:FrequencyRange</i> (See [N.4])	Optional	The secondary channel allocation for this PAL, if possible to designate. If a PAL is blocked by transient incumbent activity, the PAL CBSDs using those spectrum grants will be relocated by the SAS into this secondary assignment if possible.

## 7 Document History

Document history		
V1.0.0	3 April 2017	Approved
V1.0.0	26 July 2017	Document number updated to reflect change in release policy
V1.1.0	3 September 2020	Technical revision to clarify the userID field
V1.2.0	19 January 2021	Technical clarification on palId and required/optional fields.

