Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS):

Post Initial Certification Revisions to Baseline SAS - SAS Interface Technical Specification

(Baseline: WINNF-TS-0096-V1.3.2)

Document WINNF-TS-3010

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Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Post Initial Certification Revisions to Baseline SAS - SAS Interface Technical Specification

(Release 1 Extension)

1   Scope

The scope of this technical specification is to capture post Initial Certification revisions to "Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Spectrum Access System (SAS) - SAS Interface Technical Specification" technical specification (WINNF-TS-0096-V1.3.2 [n.17]), also known as the Release 1 Baseline SAS-SAS Protocols. Unlike the enhanced protocols captured in "CBRS Release 2 SAS to SAS Extensions (WINNF-TS-3003)", which are entirely driven by industry need to improve commercial operation, the protocols captured here extend the baseline protocols used for Initial Certification to meet extended requirements in WINNF-TS-1020 that captures changes in the FCC Part 96 rules or changes in the implementation of those rules as communicated by the FCC via Public Notice, Knowledge Database (KDB) entry, or other means. While adoption of the protocols captured in this technical specification, or any WInnForum Standard, is voluntary, as with Release 1, demonstrating conformance with these requirements might be deemed by the FCC to be sufficient to show compliance with the Part 96 rules.

The key words "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional" in this document are to be interpreted as described in RFC-2119 [n.2]. In addition, the key word "conditional" shall be interpreted to mean that the definition is an absolute requirement of this specification only if the stated condition is met.

> NOTE: Heading numbers have been kept consistent with WINNF-TS-0096-V1.3.2 [n.17] throughout for readability purposes.

2   References

2.1   Normative references

The following referenced documents are necessary for the application of the present document.

> NOTE: Normative references [n.1] to [n.16] have been kept consistent with WINNF-TS-0096-V1.3.2 [n.17] throughout for readability purposes.

[n.1]   CBRS Communications Security Technical Specification, WINNF-TS-0065, Version V1.1.0

[n.2]   RFC-2119, "Key words for use in RFCs to Indicate Requirement Levels", March 1997

[n.3]   RFC-5246, "The Transport Layer Security (TLS) Protocol Version 1.2", Dierks and Rescorla, August 2008

[n.4]   RFC-2818, HTTP Over TLS, Rescorla, May 2000

[n.5]   RFC-5280, Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile, Cooper, Santesson, Farrell, Boeyen, Housley & Polk, May 2008

[n.6]   RFC-2616, Hypertext Transfer Protocol -- HTTP/1.1, Fielding, Gettys, Mogul, Frystyk, Masinter, Leach and Berners-Lee, June 1999

[n.7]   RFC-7159, "The JavaScript Object Notation (JSON) Data Interchange Format", March 2014

[n.8]   "Requirements for Commercial Operation in the U.S. 3550-3700 MHz Citizens Broadband Radio Service Band", Wireless Innovation Forum WINNF-TS-0112

[n.9]   RFC-3339, "Date and Time on the Internet: Timestamps", July 2002

[n.10]   "Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Spectrum Access System (SAS) - Citizens Broadband Radio Service Device (CBSD) Interface Technical Specification", WINNF-TS-0016.

[n.11]   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.12]   SAS-SAS Information Sharing Framework, Wireless Innovation Forum WINNF-16-I-0093

[n.13]   RFC-7946, The GeoJSON Format, Butler et. al., August 2016.

[n.14]   Deprecated

[n.15]   "Operations for Citizens Broadband Radio Service (CBRS): Priority Access Licensee (PAL) Database Technical Specification", WINNF-TS-0245

[n.16]   NGA.STND.0036_1.0.0_WGS84 (Version 1.0.0 - July 8, 2014): Department of Defense (DoD) World Geodetic System (WGS) 1984.

[n.17]   WINNF-TS-0096-V1.3.2 "Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Spectrum Access System (SAS) - SAS Interface Technical Specification"

2.2   Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

> NOTE: Informative references [i.1] to [i.8] have been kept consistent with WINNF-TS-0096-V1.3.2 [n.17] throughout for readability purposes.

[i.1]   "SAS Functional Architecture", Wireless Innovation Forum Spectrum Sharing Committee, 7 Sep 2015, WINNF-15-P-0047-V1.0.0.

[i.2]   VOID

[i.3]   VOID

[i.4]   47 CFR §2.969 (see http://www.ecfr.gov/cgi-bin/text-idx?node=se47.1.2_1926)

[i.5]   RFC-4627, The application/json Media Type for JavaScript Object Notation (JSON), Crockford, July 2006

[i.6]   JSON Schema, http://json-schema.org/

[i.7]   Report and Order and Second Further Notice of Proposed Rulemaking, Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, Federal Communications Commission, April 21, 2015.

[i.8]   Order on Reconsideration and Second Report and Order, Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, Federal Communications Commission, May 2, 2016.

3   Definitions and abbreviations

CA	Certificate Authority
CBSD	Citizens Broadband Radio Service Device
ESC	Environmental Sensing Capability
FCC	Federal Communications Commission
FRN	FCC Registration Number
HTTP	Hypertext Transfer Protocol
HTTPS	Secure HTTP (e.g. with TLS)
ID	Identifier
JSON	JavaScript Object Notation
PAL	Priority Access License
PPA	PAL Protection Area
SAS	Spectrum Access System
TLS	Transport Layer Security
URL	Universal Resource Locator
UTC	Coordinated Universal Time

4   Description of SAS-SAS Prerequisites

4.1   Pre-requisite Procedures

No post Initial Certification revision is provided in this version of this technical specification.

4.2   Peer SAS Discovery

No post Initial Certification revision is provided in this version of this technical specification.

5   SAS-SAS Procedures

5.1   SAS Mutual Authentication and Communications Security

No post Initial Certification revision is provided in this version of this technical specification.

5.2   Record Exchanges

No post Initial Certification revision is provided in this version of this technical specification.

5.3   Message flow

No post Initial Certification revision is provided in this version of this technical specification.

6   SAS-SAS Synchronization

6.1   Time-range request support requirements

No post Initial Certification revision is provided in this version of this technical specification.

6.2   By-ID request support

No post Initial Certification revision is provided in this version of this technical specification.

6.3   Push support

No post Initial Certification revision is provided in this version of this technical specification.

6.4   Full record dump

No post Initial Certification revision is provided in this version of this technical specification.

7   Message Encoding and Transport

7.1   Message Encoding

No post Initial Certification revision is provided in this version of this technical specification.

7.2   Message Transport

No post Initial Certification revision is provided in this version of this technical specification.

7.3   Message Contents Aggregation

No post Initial Certification revision is provided in this version of this technical specification.

8   Parameters of SAS-SAS Messages

In this section, parameters of SAS-SAS messages are described in more detail. A parameter value can be one of the primitive JSON data types (string, number, boolean, array, or object). If a parameter is an object, a name for the object is given and a separate table describes parameters in the object.

All messages in the protocol are extensible using JSON extension mechanisms.

In every message and object, all fields are optional unless specifically described as required.

The JSON objects specified in the following subsections are conformant with RFC-4627 [i.5]. Note that this means that Unicode characters are used and have a default encoding of UTF-8.

Fields concerning the Release 1 extensions are described with the following table format:

Table 1: Table Format for JSON Object with Extension Fields

Field	Data Type	Field Definition
NAME: [Field name] **EXTENSION TYPE**: ["NEW" or "MODIFIED"]	[One of JSON Data Types]	Definition of the field

The label "**EXTENSION TYPE**" describes which types of extensions are made, and this label exists for Release 1 extension field. The followings are the definitions of values used for this label:

- "NEW": Parameters and response codes which do not exist in WINNF-TS-0096 [n.17] and which are defined for the purpose of "Release 1 Extension".

- "MODIFIED": Parameters and response codes which were defined originally in WINNF-TS-0096 [n.17] and which have the definitions extended or modified only for the purpose of "Release 1 Extension". Extended or modified definitions are captured in the Parameter Information column of the table.

In the following sections, only the tables which define JSON object having one or more "NEW" and/or "MODIFIED" fields will be shown. Any field which does not have the label "EXTENSION TYPE", is specified in WINNF-TS-0096 [n.17] and its description is reproduced in each table <u>for information only</u>.

8.1 SAS Administrator Message

No post Initial Certification revision is provided in this version of this technical specification.

8.1.1 ContactInformation object

No post Initial Certification revision is provided in this version of this technical specification.

8.2 SAS Implementation Message

No post Initial Certification revision is provided in this version of this technical specification.

8.2.1 FCCInformation object

No post Initial Certification revision is provided in this version of this technical specification.

8.3 CBSD Data Message

No post Initial Certification revision is provided in this version of this technical specification.

8.3.1 Required and Optional Registration Data

No post Initial Certification revision is provided in this version of this technical specification.

8.3.2 Signaling Grant Termination

No post Initial Certification revision is provided in this version of this technical specification.

8.4 ESC Sensor Message

No post Initial Certification revision is provided in this version of this technical specification.

8.5 Zone Definition Message

No post Initial Certification revision is provided in this version of this technical specification.

8.5.1 PPA Information

When SAS Administrators exchange the Zone Data record for a PAL Protection Area (PPA), the *ppaInfo* field is included in the *ZoneData* object.

Table 2: *PPAInformation* object

Field	Data Type	Field Definition
NAME: *palId*	array of string	List of one or more PAL Database record IDs (ref: [n.15]) upon which the PPA is based. All PALs indicated in the list shall have a single PAL Holder.
NAME: *cbsdReferenceId*	array of string	List of one or more CBSD Reference IDs in the cluster list of the PPA.
NAME: *ppaBeginDate*	string	Date of the start of the PPA protection period. It is expressed in UTC using the format, YYYY-MM-DDThh:mm:ssZ, as defined by [N.6].
NAME: *ppaExpirationDate*	string	This field represents the PPA expiration date. It is expressed in UTC using the format, YYYY-MM-DDThh:mm:ssZ, as defined by [N.6].
NAME: *ppaRegionType*	string	This field describes the region type of the PPA to be used in calculating the path loss for PPA protection. The field shall be set to one of the following values: • "URBAN" • "SUBURBAN" • "RURAL"

NAME: *palChannel* **EXTENSION TYPE**: NEW	object: *FrequencyRange* (see [n.10])	If included, this parameter defines the 10 MHz channel for *palId* that may be different from *primaryAssignment* in [n.15]. NOTE: Support of this parameter is at the discretion of each SAS Administrator.

8.6   Coordination Event Message

No post Initial Certification revision is provided in this version of this technical specification.

8.7   Full Activity Dump Message

No post Initial Certification revision is provided in this version of this technical specification.

8.7.1   *ActivityDumpFile object*

No post Initial Certification revision is provided in this version of this technical specification.

9 Document History

Document history		
V1.0.0	19 September 2023	Initial publication