



CBRS Coexistence CSAS Profile



OnGo-TS-2002

V4.0.0

March 16, 2021

LEGAL NOTICES AND DISCLOSURES

THIS SPECIFICATION IS PROVIDED "AS IS," WITHOUT ANY REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS, IMPLIED, OR STATUTORY; AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, ONGO ALLIANCE, AS WELL AS ITS MEMBERS AND THEIR AFFILIATES, HEREBY DISCLAIM ANY AND ALL REPRESENTATIONS AND WARRANTIES, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY, OR RELIABILITY, OR ARISING OUT OF ANY ALLEGED COURSE OF PERFORMANCE, DEALING OR TRADE USAGE. ANY PERMITTED USER OR IMPLEMENTER OF THIS SPECIFICATION ACCEPTS ALL RISKS ASSOCIATED WITH THE USE OR INABILITY TO USE THIS SPECIFICATION.

THE PROVISION OR OTHER PERMITTED AVAILABILITY OF OR ACCESS TO THIS SPECIFICATION DOES NOT GRANT ANY LICENSE UNDER ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHTS ("IPR"). FOR MORE INFORMATION REGARDING IPR THAT MAY APPLY OR POTENTIAL AVAILABILITY OF LICENSES, PLEASE SEE THE [ONGO ALLIANCE IPR POLICY](#). ONGO ALLIANCE TAKES NO POSITION ON THE VALIDITY OR SCOPE OF ANY PARTY'S CLAIMED IPR AND IS NOT RESPONSIBLE FOR IDENTIFYING IPR.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, UNDER NO CIRCUMSTANCES WILL ONGO ALLIANCE, OR ANY OF ITS MEMBERS OR THEIR AFFILIATES, BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, PUNITIVE, OR OTHER FORM OF DAMAGES, EVEN IF SUCH DAMAGES ARE FORESEEABLE OR IT HAS BEEN ADVISED OR HAS CONSTRUCTIVE KNOWLEDGE OF THE POSSIBILITY OF SUCH DAMAGES, ARISING FROM THE USE OR INABILITY TO USE THIS SPECIFICATION, INCLUDING WITHOUT LIMITATION ANY LOSS OF REVENUE, ANTICIPATED PROFITS, OR BUSINESS, REGARDLESS OF WHETHER ANY CLAIM TO SUCH DAMAGES SOUNDS IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), PRODUCT LIABILITY, OR OTHER FORM OF ACTION.

THIS DOCUMENT (INCLUDING THE INFORMATION CONTAINED HEREIN) IS PROVIDED AS A CONVENIENCE TO ITS READERS, DOES NOT CONSTITUTE LEGAL ADVICE, SHOULD NOT BE RELIED UPON FOR ANY LEGAL PURPOSE, AND IS SUBJECT TO REVISION OR REMOVAL AT ANY TIME WITHOUT NOTICE. THIS DOCUMENT IS PROVIDED ON AN "AS IS", "AS AVAILABLE" AND "WITH ALL FAULTS" BASIS. ONGO ALLIANCE MAKES NO REPRESENTATION, WARRANTY, CONDITION OR GUARANTEE AS TO THE USEFULNESS, QUALITY, SUITABILITY, TRUTH, ACCURACY, OR COMPLETENESS OF THIS DOCUMENT OR ANY INFORMATION CONTAINED HEREIN. ANY PERSON THAT USES OR OTHERWISE RELIES IN ANY MANNER ON THE INFORMATION SET FORTH HEREIN DOES SO AT HIS OR HER SOLE RISK.

IMPLEMENTATION OF A [NETWORK] AND/OR RELATED PRODUCTS OR SERVICES IS OFTEN COMPLEX AND HIGHLY REGULATED, REQUIRING COMPLIANCE WITH NUMEROUS LAWS, STATUTES, REGULATIONS AND OTHER LEGAL REQUIREMENTS ("LEGAL REQUIREMENTS"). AMONG OTHER THINGS, APPLICABLE LEGAL REQUIREMENTS MAY INCLUDE NETWORK OPERATOR REQUIREMENTS UNDER FEDERAL LAW, REQUIREMENTS RELATING TO E-911, ETC. A DISCUSSION OF SUCH LEGAL REQUIREMENTS IS BEYOND THE SCOPE OF THIS DOCUMENT. ACCORDINGLY, NETWORK OPERATORS AND OTHERS INTERESTED IN IMPLEMENTING NETWORKS OR RELATED SOLUTIONS ARE STRONGLY ENCOURAGED TO CONSULT WITH APPROPRIATE LEGAL, TECHNICAL AND BUSINESS ADVISORS PRIOR TO MAKING ANY IMPLEMENTATION DECISIONS.

OnGo Alliance
3855 SW 153rd Drive, Beaverton, OR 97003
www.ongoalliance.org
info@ongoalliance.org
Copyright © 2021 OnGo Alliance, All Rights Reserved

Notice Alliance Mandate Change

As of November 22, 2020, the CBRS Alliance Members approved the amendment of the Alliance's Bylaws and Articles of Incorporation, which took effect January 1, 2021, replacing all instances of "CBRS Alliance" with "OnGo Alliance".

To maintain each of its published specification integrity, the OnGo Alliance is providing this updated revision of the specification referencing the Alliance new name and brand. The specification numbering follows the same pattern as before (i.e. CBRS-A-TS-XXXX becomes OnGo-TS-XXXX) while version numbers remain the same for ease of reference.

Moving forward new specification releases will be updated to the completely new branding format. If you have any questions, please contact admin@ongoalliance.org.



CBRS Coexistence CSAS Profile

CBRSA-TS-2002

V4.0.0

5 January 2021



LEGAL DISCLAIMERS AND NOTICES

THIS SPECIFICATION IS PROVIDED "AS IS," WITHOUT ANY REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS, IMPLIED, OR STATUTORY; AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, CBRS ALLIANCE, AS WELL AS ITS MEMBERS AND THEIR AFFILIATES, HEREBY DISCLAIM ANY AND ALL REPRESENTATIONS AND WARRANTIES, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY, OR RELIABILITY, OR ARISING OUT OF ANY ALLEGED COURSE OF PERFORMANCE, DEALING OR TRADE USAGE. ANY PERMITTED USER OR IMPLEMENTER OF THIS SPECIFICATION ACCEPTS ALL RISKS ASSOCIATED WITH THE USE OR INABILITY TO USE THIS SPECIFICATION.

THE PROVISION OR OTHER PERMITTED AVAILABILITY OF OR ACCESS TO THIS SPECIFICATION DOES NOT GRANT ANY LICENSE UNDER ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHTS ("IPR"). FOR MORE INFORMATION REGARDING IPR THAT MAY APPLY OR POTENTIAL AVAILABILITY OF LICENSES, PLEASE SEE [THE CBRS ALLIANCE IPR POLICY](#). CBRS ALLIANCE TAKES NO POSITION ON THE VALIDITY OR SCOPE OF ANY PARTY'S CLAIMED IPR AND IS NOT RESPONSIBLE FOR IDENTIFYING IPR.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, UNDER NO CIRCUMSTANCES WILL CBRS ALLIANCE, OR ANY OF ITS MEMBERS OR THEIR AFFILIATES, BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, PUNITIVE, OR OTHER FORM OF DAMAGES, EVEN IF SUCH DAMAGES ARE FORESEEABLE OR IT HAS BEEN ADVISED OR HAS CONSTRUCTIVE KNOWLEDGE OF THE POSSIBILITY OF SUCH DAMAGES, ARISING FROM THE USE OR INABILITY TO USE THIS SPECIFICATION, INCLUDING WITHOUT LIMITATION ANY LOSS OF REVENUE, ANTICIPATED PROFITS, OR BUSINESS, REGARDLESS OF WHETHER ANY CLAIM TO SUCH DAMAGES SOUNDS IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), PRODUCT LIABILITY, OR OTHER FORM OF ACTION.

Table of Contents

1	Introduction and Scope	1
2	References	1
3	Definitions and Abbreviations	2
3.1	Abbreviations	2
3.2	Definitions.....	2
4	WinnForum Release 2 Development.....	4
5	Business Use Cases to Address.....	6
6	CSAS Functional Profiles	7
6.1	Baseline CSAS Profile	8
6.2	CSAS Profile for Fixed Wireless Support	9
6.3	CSAS Profile for Mobile Network Support.....	10
6.4	CSAS Profile for IOT Support.....	11
7	Comparison of CSAS Profiles [<i>Informative</i>].....	12

LIST OF TABLES

Table 4.1: *WinnForum Release 2 Features*

Table 6.1: *Baseline CSAS Profile*

Table 6.2: *Fixed Wireless CSAS Profile*

Table 6.3: *Mobile Network CSAS Profile*

Table 6.4: *IOT CSAS Profile*

Table 7.1: *Summary of CSAS Profile Comparisons*

1 Introduction and Scope

An objective of the CBRS Alliance is to allow flexible use of the CBRS band while supporting coexistence of multiple deployments. A Technical Specification [1] has been developed to address coexistence among multiple LTE and/or 5G NR networks. The CBRS Alliance Coexistence Group (CxG) is managed by a Coexistence Manager (CxM) that is combined with a SAS to form a CBRS Alliance SAS Entity (CSAS). Moreover, WINNForum is in process of defining additional optional features on top of Release 1 specifications [2] in order to improve the performance of CBRS networks [11].

This specification defines a set of profiles characterized by a combination of baseline CBRS Alliance Coexistence functionalities as defined by [1] and a subset of WINNForum optional features to address the needs of a particular CBRS use case. Each of these specific sets of features are called a “CSAS Profile” in this document.

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 [3].

Note: LTE and E-UTRA are equivalent terms for the purposes of this TS. Furthermore, unless otherwise noted, references to CBSDs refer to CBRS Alliance CBSDs.

2 References

- [1] CBRSA-TS-2001, “CBRS Coexistence Technical Specifications”,
- [2] WINNF-TS-0112, “Requirement for Commercial Operation in the U.S. 3550-3700 MHz Citizen Broadband Radio Service Band”, V1.8.0.
- [3] RFC-2119, “Key Words in RFCs to indicate Requirement Levels.”
- [4] 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>.
- [5] WINNF-TS-0061, “Test and Certification for Citizens Broadband Radio Service (CBRS); Conformance and Performance Test Technical Specification; SAS as Unit Under Test (UUT)”, Version V1.5.1.
- [6] WINNF-TS-1001, “CBRS Operational and Functional Requirements (Release 2)”.
- [7] WINNF-SSC-0010, “Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): WINNForum Recognized CBRS Grouping Parameters”.
- [8] WINNF-TS-3002, “Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Extensions to Spectrum Access System (SAS) - Citizens Broadband Radio Service Device (CBSD) Interface Technical Specification (Release 2)
- [9] WINNF-TS-3003, “Signaling Protocols and Procedures for Citizens Broadband Radio Service (CBRS): Extensions to Spectrum Access System (SAS) - SAS Interface Technical Specification (Release 2)”



- [10] WINNF-TR-5001, “CBRS Deployment Guidelines for Installers”.
- [11] Enhancements to CBRS Baseline Standards (Release 2)”, Wireless Innovation Forum, available at <https://cbrs.wirelessinnovation.org/enhancements-to-baseline-specifications>
- [12] ONGO Private LTE Deployment Guide, CBRS-Alliance, “<https://www.brsalliance.org/resource/private-lte-enterprise-networks-using-ongo-technology>”

3 Definitions and Abbreviations

3.1 Abbreviations

2-D: Two Dimensional

CBRS: Citizens Broadband Radio Service

CBRSA: CBRS Alliance

CBSD: Citizens Broadband Radio Service Device

DP: Domain Proxy.

GAA: General Authorized Access.

LTE: Long Term Evolution

NRI: Non-Regulatory Impacting

PAL: Priority Access License

RI: Regulatory Impacting

SAS: Spectrum Access System

TDD: Time Division Duplex

TR: Technical Report

TS: Technical Specifications

UE: User Equipment

3.2 Definitions



CSAS Profile: A statement of the mandatory, recommended, and optional procedures, messages, and parameters for the implementation of a compliant CSAS.

Non-Regulatory Impacting (NRI) features: Features that do not impact the result of approved WinnForum Release 1 test and certification process.

Regulatory Impacting (RI) features: Features that may impact the result of WinnForum Release 1 test and certification or Part 96 requirements.

4 WinnForum Release 2 Development

Per Part 96 FCC rules [4], every SAS must be compliant to WinnForum Release 1 Test and Certification Specifications [5]. It is expected that a mix of WinnForum Release 1 and post WinnForum Release 1 (Release 2, Release 3, etc., herein called Release 2) deployments coexist in the CBRS ecosystem for the foreseeable future. No entity is mandated to support any functionality beyond WinnForum Release 1, therefore supporting WinnForum Release 2 is not mandatory for any entity, including SASs. All entities claiming support for WinnForum Release 2 are responsible for working with WinnForum Release 1 entities in a mixed Release environment. Namely, any WinnForum Release 2 entity must support backward compatibility to WinnForum Release 1 entities using SAS-CBSD and SAS-SAS protocols, and any feature requiring coordination among SASs. WinnTo that end, all features defined in WinnForum Release 2 Specifications are optional [6].

To address backward compatibility with WinnForum Release 1, the only mandatory feature for any WinnForum Release 2 entity (SAS or CBSD) is to support a mandatory protocol update to allow feature discovery/capability exchange for any WinnForum Release 2 feature over SAS-CBSD/DP and SAS-SAS interfaces. All other WinnForum Release 2 features are optional. The capability exchange protocol update will support selective implementation of WinnForum Release 2 optional features.

Using the capability exchange protocol, SASs and CBSDs may inquire about implemented WinnForum Release 2 optional features from other entities (SAS from CBSD, CBSD from SAS, and SAS from SAS) or inform other entities about implementation of such features.

As part of backward compatibility with WinnForum Release 1, careful consideration must be given to features impacting any coordination among SASs including features requiring substantial similarity in performing incumbent protection or other activities. Any entity (SAS or CBSD) that does not exchange any WinnForum Release 2 capability with a peer entity, is considered as WinnForum Release 1 by the peer entity. If multiple SASs manage CBSDs impacting the same incumbent, for any feature impacting coordination among SASs, they will fall back to the lowest common feature set of all those SASs, i.e. WinnForum Release 1.

WinnForum has divided the WinnForum Release 2 features into two main categories, i.e. Regulatory Impacting (RI) and Non-Regulatory Impacting (NRI).

NRI features are defined as features that do not impact the result of approved WinnForum Release 1 test and certification process. An example of such features is Enhanced Grouping Handling feature, which extends the concept of Coexistence Group in Release 1 to allow a CBSD to register with a SAS indicating it is part of a user/operator defined group. These features do NOT change how the SAS treats the CBSD with respect to incumbent or PAL protections.

RI features are defined as the features that may impact the result of WINnForum Release 1 test and certification or Part 96 requirements. An example of these features is the support of 2-D antenna patterns, which is aimed to increase spectral utilization and improve incumbent and PAL protection if applied beyond GAA.

Table 4-1 summarizes existing WINnForum Release 2 features, which are considered for CSAS profiling. The table includes “PAL Leasing”, which is defined as an optional feature as part of WINnForum Release 1 specification [10,12].

NOTE: Different CSASs can implement different CSAS Profiles. Additionally, different CSASs could implement different optional features even if they are operating with the same CSAS Profile. In those cases, if a feature requires CSAS-CSAS coordination, the feature might not be operationally enabled according to the Feature Capability Exchange requirements in [6] and the requirements of a particular OnGo use cases might not be addressed.

Table 4-1: WinnForum Release 2 Features

Feature	NRI/RI
SAS-SAS and SAS-CBSD Capability Exchange / Update	NRI
Enhanced CBSD Group Handling	NRI
Enhanced Antenna Patterns	RI & NRI
CPE-CBSD Indicator	NRI
Passive DAS	NRI
Principal-Subordinate Single Frequency Group	NRI
Coexistence Group	NRI
PAL Leasing	Optional feature from WinnForum Release 1

5 Business Use Cases to Address

To address the objectives of this documents, the following list introduces some of the candidate use cases within the CBRS ecosystem determined by CBRS Alliance.

- Fixed Wireless Access (section 6.2)
- Mobile broadband networks (section 6.3)
- Internet of Things (IoT) (e.g. Industrial IoT, Education IoT, Health IoT) (section 6.4)

NOTE: Use cases of private networks, public venues and utilities are not addressed in this version of this document, but they will be addressed in the future version.

6 CSAS Functional Profiles

Using the WINNForum Release 2 features outlined in Table 4-1, in this Section, CSAS functional profiles are defined to address the use cases listed in Section 5. Depending on new use cases required by the CBRS Alliance Business Working Group, these SAS profiles might be extended. In the tables depicted in this Section, a feature is assigned a Functional ID, and relevant references are provided for each feature.

In order to support the CBRS Alliance specifications, a Baseline CSAS Profile is introduced in Section 6.1. This is the minimum level of feature support to be considered compliant with CBRS Alliance Release 3 and beyond, and at the same time support the required regulatory requirements. Additional profiles are introduced, as enhancements over the Baseline CSAS Profile to support specific use cases.

In this section, three level of supports are designated for each feature:

- **Required**: The support of the feature is required to address the requirements of the specific use case.
- **Recommended**: Support of the feature is not required to address the requirements of the specific use case but will enhance the OnGo network performance for the use case.
- **Optional**: Support of the feature is neither required to address the requirements of the specific use case, nor Recommended to enhance the OnGo network performance for the use case.

In this section, “CSAS Release” refers to the latest version of CBRSA-TS-2001 [1] in each release.

6.1 Baseline CSAS Profile

This profile defines the minimum level of CSAS feature support to be considered compliant with CBRS Alliance Release 4 and beyond, and at the same time support the regulatory requirements.

Table 6-1: Baseline CSAS Profile

Functional ID	Short description	Source		CSAS Release	CSAS Support
		Document	Section		
SAS-0001	All mandatory Release 2 SAS-CBSD protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-01, REL2-R2-SGN-31, REL2-R2-SGN-32	2.1	Required
		[8]	6.2 & 8 & 8.2		
SAS-0002	All mandatory Release 2 SAS-SAS protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-02, REL2-R3-SGN-03, REL2-R3-SGN-04, REL2-R3-SGN-05	2.1	Required
		[9]	4.1 & 7		
SAS-0003	Enhanced CBSD Group handling	[8]	6.3	2.1	Required
		[9]	4.2		
SAS-0004	Principal-Subordinate Single Frequency Group	[6]	Annex 1	2.1	Optional
		[7]	Annex 2 or Annex 3 or Annex 4		
SAS-0005	Coexistence Group	[6]	7.1	2.1	Required
SAS-0006	Enhanced antenna pattern	[7]	Annex 2	N/A	Optional
		[8]	6.4		
		[10]			
SAS-0007	CPE-CBSD Indicator	[8]	6.5 & 8.2.3	N/A	Optional
SAS-0008	Passive DAS	[7]		N/A	Optional
		[6]	Annex 3.1.1		
SAS-0009	PAL Leasing	[4]	Part 96.66	N/A	Recommended

6.2 CSAS Profile for Fixed Wireless Support

The CSAS Profile in Table 6-2 applies to the Fixed Wireless internet services.

Table 6-2: Fixed Wireless CSAS Profile

Functional ID	Short description	Source		CSAS Release	CSAS Support
		Document	Section		
SAS-0001	All mandatory Release 2 SAS-CBSD protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-01, REL2-R2-SGN-31, REL2-R2-SGN-32	2.1	Required
		[8]	6.2 & 8 & 8.2		
SAS-0002	All mandatory Release 2 SAS-SAS protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-02, REL2-R3-SGN-03, REL2-R3-SGN-04, REL2-R3-SGN-05	2.1	Required
		[9]	4.1 & 7		
SAS-0003	Enhanced CBSD Group handling	[8]	6.3	2.1	Required
		[9]	4.2		
SAS-0004	Principal-Subordinate Single Frequency Group	[6]	Annex 1	2.1	Required
		[7]	Annex 2 or Annex 3 or Annex 4		
SAS-0005	Coexistence Group	[6]	7.1	2.1	Required
SAS-0006	Enhanced antenna pattern	[7]	Annex 2	N/A	Recommended
		[8]	6.4		
		[10]			
SAS-0007	CPE-CBSD Indicator	[8]	6.5 & 8.2.3	N/A	Required
SAS-0008	Passive DAS	[7]		N/A	Optional
		[6]	Annex 3.1.1		
SAS-0009	PAL Leasing	[4]	Part 96.66	N/A	Recommended

6.3 CSAS Profile for Mobile Network Support

The CSAS Profile in Table 6-3 applies to Mobile Network support.

Table 6-3: Mobile Network CSAS Profile

Functional ID	Short description	Source		CSAS Release	CSAS Support
		Document	Section		
SAS-0001	All mandatory Release 2 SAS-CBSD protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-01, REL2-R2-SGN-31, REL2-R2-SGN-32	2.1	Required
		[8]	6.2 & 8 & 8.2		
SAS-0002	All mandatory Release 2 SAS-SAS protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-02, REL2-R3-SGN-03, REL2-R3-SGN-04, REL2-R3-SGN-05	2.1	Required
		[9]	4.1 & 7		
SAS-0003	Enhanced CBSD Group handling	[8]	6.3	2.1	Required
		[9]	4.2		
SAS-0004	Principal-Subordinate Single Frequency Group	[6]	Annex 1	2.1	Optional
		[7]	Annex 2 or Annex 3 or Annex 4		
SAS-0005	Coexistence Group	[6]	7.1	2.1	Required
SAS-0006	Enhanced antenna pattern	[7]	Annex 2	N/A	Recommended
		[8]	6.4		
		[10]			
SAS-0007	CPE-CBSD Indicator	[8]	6.5 & 8.2.3	N/A	Optional
SAS-0008	Passive DAS	[7]		N/A	Optional
		[6]	Annex 3.1.1		
SAS-0009	PAL Leasing	[4]	Part 96.66	N/A	Recommended

6.4 CSAS Profile for IOT Support

The CSAS Profile in Table 6-4 applies to IoT (Internet of Things) support.

Table 6-4: IoT CSAS Profile

Functional ID	Short description	Source		CSAS Release	CSAS Support
		Document	Section		
SAS-0001	All mandatory Release 2 SAS-CBSD protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-01, REL2-R2-SGN-31, REL2-R2-SGN-32	2.1	Required
		[8]	6.2 & 8 & 8.2		
SAS-0002	All mandatory Release 2 SAS-SAS protocol requirements, including inter-release operation and feature capability exchange/update	[6]	REL2-R3-SGN-02, REL2-R3-SGN-03, REL2-R3-SGN-04, REL2-R3-SGN-05	2.1	Required
		[9]	4.1 & 7		
SAS-0003	Enhanced CBSD Group handling	[8]	6.3	2.1	Required
		[9]	4.2		
SAS-0004	Principal-Subordinate Single Frequency Group	[6]	Annex 1	2.1	Optional
		[7]	Annex 2 or Annex 3 or Annex 4		
SAS-0005	Coexistence Group	[6]	7.1	2.1	Required
SAS-0006	Enhanced antenna pattern	[7]	Annex 2	N/A	Recommended
		[8]	6.4		
		[10]			
SAS-0007	CPE-CBSD Indicator	[8]	6.5 & 8.2.3	N/A	Optional
SAS-0008	Passive DAS	[7]		N/A	Optional
		[6]	Annex 3.1.1		
SAS-0009	PAL Leasing	[4]	Part 96.66	N/A	Recommended

7 Comparison of CSAS Profiles *[Informative]*

Table 7-1 summarizes and compares the CSAS Profiles introduced in this document

Table 7-1: Summary of CSAS Profile Comparisons

Functional ID	Short description	Baseline CSAS	Fixed Wireless CSAS	Mobile Network CSAS	IOT CSAS
SAS-0001	All mandatory Release 2 SAS-CBSD protocol requirements, including inter-release operation and feature capability exchange/update	Required	Required	Required	Required
SAS-0002	All mandatory Release 2 SAS-SAS protocol requirements, including inter-release operation and feature capability exchange/update	Required	Required	Required	Required
SAS-0003	Enhanced CBSD Group handling	Required	Required	Required	Required
SAS-0004	Principal-Subordinate Single Frequency Group	Optional	Required	Optional	Optional
SAS-0005	Coexistence Group	Required	Required	Required	Required
SAS-0006	Enhanced antenna pattern	Optional	Recommended	Recommended	Recommended
SAS-0007	CPE-CBSD Indicator	Optional	Required	Optional	Optional
SAS-0008	Passive DAS	Optional	Optional	Optional	Optional
SAS-0009	PAL Leasing	Recommended	Recommended	Recommended	Recommended



Appendix A: Document History

Table 19: Change History

Version	Date	Description
Rev 4.0.0	January xx, 2021	First Release of CBRSA-TS-2002