



Reconfigurable Radio Systems (RRS); Dynamic Spectrum Allocation Service (DSAS); System requirements

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Reconfigurable Radio Systems (RRS).

Modal verbs terminology

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Introduction

The Dynamic Spectrum Allocation Service (DSAS) manages spectrum access for non-primary users in frequency bands in which spectrum sharing is applied. DSAS guarantees interference-free operation for the primary users and offers dynamic spectrum access for non-primary users based on a situational assessment of the actual spectrum demand and on-site spectrum occupation. Furthermore, the following scheme can be used for co-primary allocation and coordination with the goal of effectively sharing band with guaranteed QoS.

In ETSI TR 103 885 [i.1], several use cases for temporary and flexible spectrum access are analysed and their requirements are compared with existing spectrum sharing frameworks. The results are used as the basis for the system requirements of the dynamic spectrum allocation service. The requirements are split into two categories:

- functional requirements that describe system behaviour under specific conditions and contain aspects of the end user expectations;
- technical requirements that describe the features and characteristics of the system that ensure pre-defined output performance and system's quality.

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1 Scope

The present document specifies system requirements for the Dynamic Spectrum Allocation Service (DSAS) to support dynamic, temporary, and flexible spectrum sharing in an efficient, automated, and frequency and technology agnostic way based on the analysis introduced in ETSI TR 103 885 [i.1]. The report considers existing systems such as Automated Frequency Coordination (AFC), evolved License Shared Access (eLSA), or Citizens Broadband Radio Service Spectrum Access System (CBRS SAS), which could need to be adapted or simplified instead of developing a new system from scratch. It outlines which features of the previously mentioned systems can be removed, because they are unnecessary in the context of the intended use cases, and which features need to be added to fill identified gaps. In addition, the frequency ranges currently covered by AFC, eLSA, and CBRS SAS will be extended to other frequency ranges.

Functional and technical requirements of the DSAS are described and defined for two different coordination approaches:

- **Inter-system Coordination (INC):** a sharing framework between different communication systems, in which Primary Users (PU) of the relevant frequency bands are protected against all users of lower tiers (i.e. Non-Primary Users (NPU)). NPUs access is granted without any guaranteed level of Quality of Service (QoS). When only INC is enforced, NPUs may be requested to change their RF parameters and their overall system performance during their operation time. INC is comparable with the determination of available channels and its operational parameters on which a NPU device is allowed to operate at its geographic coordinates.
- **Intra-system Coordination (IRC):** a sharing framework in which PUs of the relevant frequency bands get protected against all user of lower tiers (NPUs) and NPUs are getting coordinated to minimize interference between them and to guarantee a certain level of QoS. The level of QoS experienced by the NPUs depends on its prioritization, the current demand for spectrum, the neighbouring situation, and maybe the price the user is willing to pay. IRC is comparable with a channel assignment/licensing including its operational parameters to NPU devices at its geographic coordinates.

The requirements captured in the present document are described in a technology neutral manner and are applicable for any wireless technology. DSAS enables dynamic spectrum sharing in any frequency band that is assigned for coordinated sharing.

2 References

2.1 Normative references

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[i.1] ETSI TR 103 885 (V1.1.2): "Reconfigurable Radio Systems (RRS); Feasibility study on existing spectrum sharing frameworks for temporary and flexible spectrum access".

3 Definition of terms, symbols, and abbreviations

3.1 Terms

Void.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

dB	decibel
dBm	decibel-milliwatt
dBm/kHz	decibel-milliwatt per kilohertz
f_c	centre frequency
GHz	gigahertz
h	hour
kHz	kilohertz
MHz	megahertz
m	meter
min	minute
mW	milliwatt

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AFC	Automated Frequency Coordination
B	channel Bandwidth
CBRS	Citizens Broadband Radio Service
CDB	Certified S3D-Installer Data Base
CR	Coordination Requirement
CSI	Certified S3D-Installer
CSI-ID	Certified S3D-Installer Identifier
DGR	Device General Requirement

NOTE: Shared spectrum service.

DL	Downlink
DSAS	Dynamic Spectrum Allocation Service
DSQ	Device Security reRequirement

NOTE: Shared spectrum service.