Source: TC RRS

ETSI TC - RRS (Reconfigurable Radio Systems)

Presented by: Paul Bender, TC RRS chair

International Spectrum Sharing Workshop
27 June 2024
Reston, Virginia

Organization

- ETSI Reconfigurable Radio Systems– Structure and Mission
- Key Areas of Activity
- Members and Participants
- Technical Summary
- Next Steps

ETSI RRS – Structure and Mission

Terms of Reference: “TC RRS has responsibility of standardization activities related to Reconfigurable Radio Systems encompassing system solutions related to Software Defined Radio (SDR) and Cognitive Radio (CR)…”

TC RRS

Chair:
Paul Bender (BMWi, Germany),
Vice Chair:
Luca Rose, (Nokia, France)

WG1:
System Aspects, Cognitive functionalities and Radio Equipment Architecture (SCREA)

Chair: Luca Rose (Nokia, France), Vice-Chair: Dr. Markus Mueck (Intel Germany)

WG3:
RRS Security, Certification and Declaration of Conformity

Chair: Dr. Markus Mueck (Intel Germany), Vice-Chair: Paul Bender (BMWi, Germany)

EC Expert Group Radio Equipment (EG RE)

ETSI representative on RRS: Niklas Boström (Ericsson, Sweden)

Key Areas of Activity

EC Expert Group RE		• TC RRS is ETSI‘s focal point on RED Article 3(3)(i) on the combination of SW & HW • TC RRS is regularly coordinating with ETSI TCs and ISGs on ETSI‘s position in EG RE
Software Reconfiguration	Technical Specifications in the field of RRS	• TC RRS is developping a comprehensive software reconfiguration framework i) for Radio Equipment in general [2-7] and ii) specifically for Mobile Devices [9-14], all published as European Norms. An overview is available in ETSI White Paper #57 [1] and ETSI Webinar [32].
	Interaction with policy makers	• TC RRS has submitted elements of the TC RRS framework to EC Expert Group RRS/RE for consideration in the context of RED Article 3(3)(i) on combination of SW & HW.
Radio Interface Engine		• A generic (functional) framework has been defined for acquiring and managing context information in any radio context [29-31].

Key Areas of Activity by TC RRS on Spectrum Sharing

Spectrum Sharing	LSA – European „flavour“ of Spectrum Sharing	TC RRS has developed Europe‘s Spectrum Sharing „flavour“ for 2.3-2.4 GHz called „License Shared Access (LSA)“ [19-21] in close alignment with CEPT and 3GPP [20].
	eLSA – enabling local deployment	TC RRS further generalized LSA and developed evolved LSA (eLSA) [22-25], enabling high QoS localized spectrum sharing.
	Dynamic Spectrum Allocation Service (DSAS)	Currently, TC RRS further develops Spectrum Sharing [26-28] to 1. be technology and frequency agnostic, 2. enable dynamic sharing and 3. allow coordination of non-primary users.

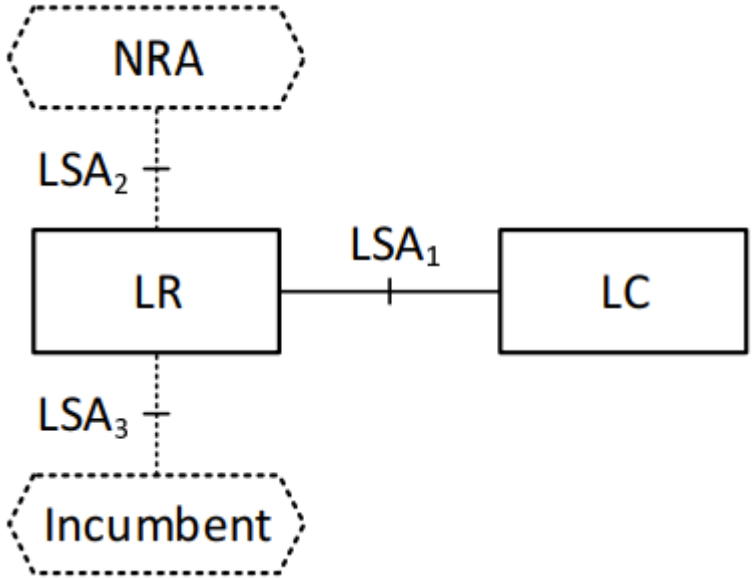
Members and Participants of TC RRS

TC RRS Meetings are attended by

- Manufacturers
- Administrations
- Industry Associations
- SMEs
- Academia

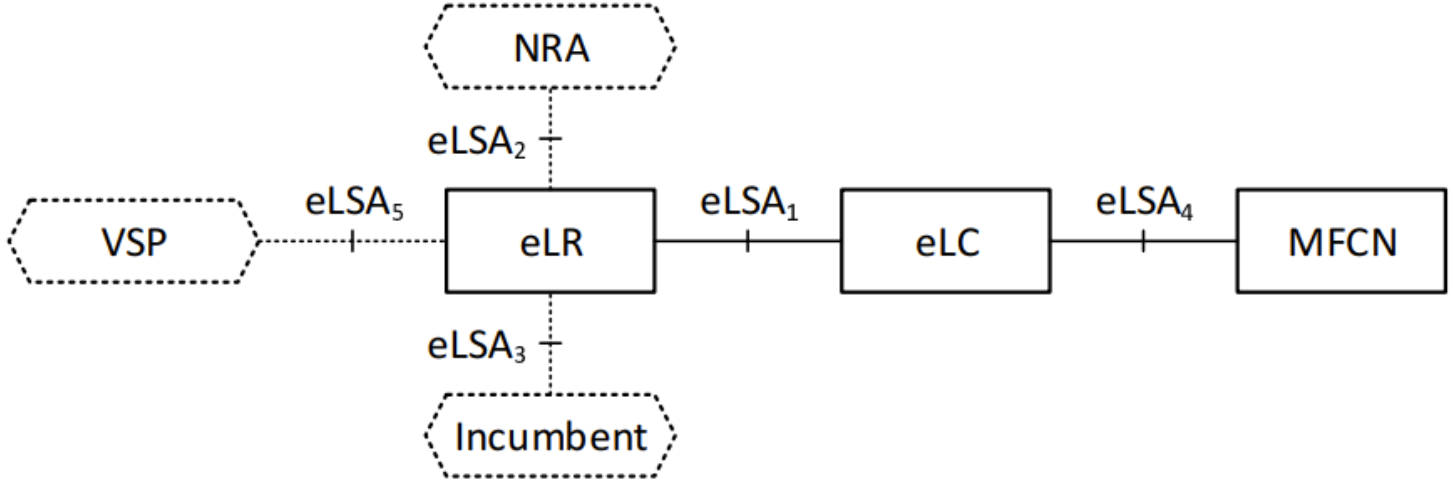
Technical Summary of TC RRS – Spectrum Sharing

LSA – European „flavour“ of Spectrum Sharing



- Data-base managed sharing (no sensing)
- Nationwide, cellular focused

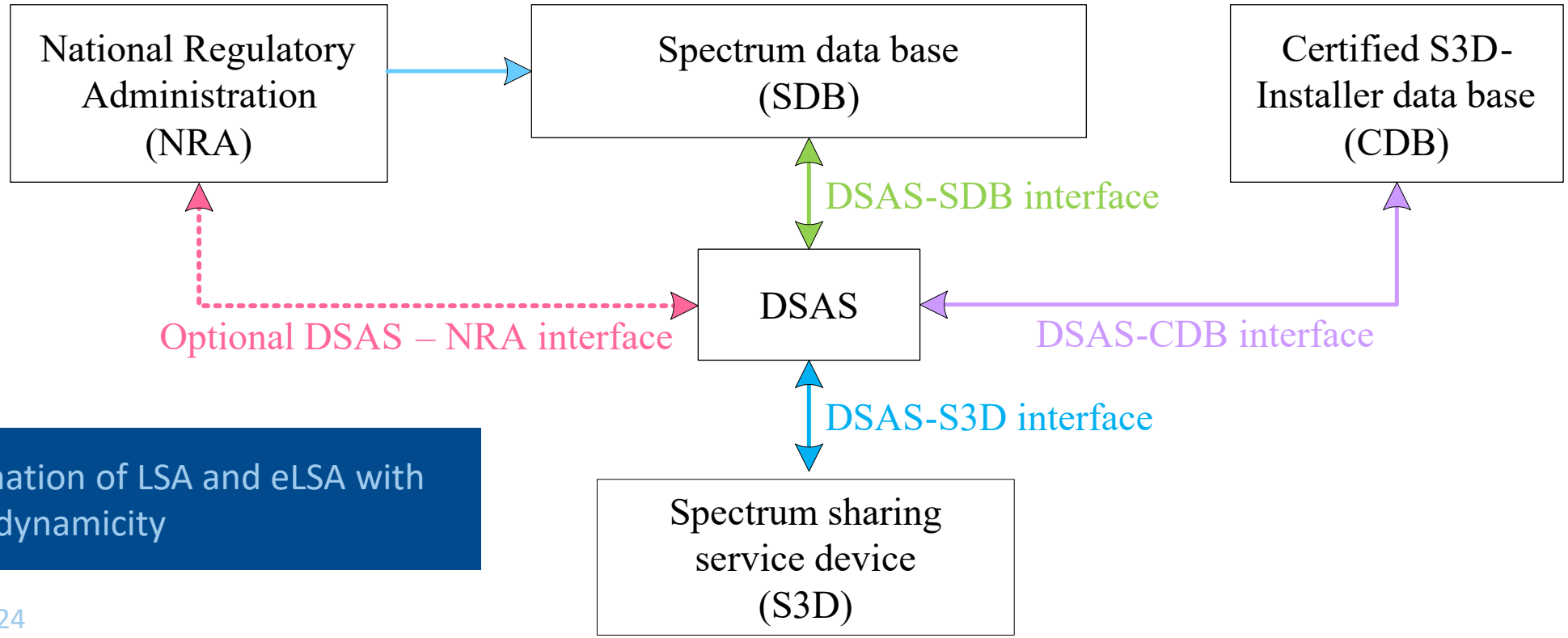
eLSA – enabling local deployment



- Local deployment, any type of application (not only cellular)
- Local management on allocation of shared spectrum

Technical Summary of TC RRS – Spectrum Sharing

Dynamic Spectrum Allocation Service (DSAS)



- Combination of LSA and eLSA with higher dynamicity

Next Steps

- TC RRS will continue to work on Spectrum Sharing
  - Work is ongoing with the Wireless Innovation Forum to further drive Spectrum Sharing across all regions (including LSA/eLSA, CBRS, DSAS etc.)
- TC RRS will maintain its coordination role between ETSI and European Commission in the area of Software Reconfiguration

Abbreviations

EC	European Commission
ETSI	European Telecommunications Standards Institute
eLC	evolved eLSA Controller
eLSA	evolved Licensed Shared Access
eLR	evolved LSA Repository
ISG	Industry Specification Group
LC	LSA Controller
LR	LSA Repository
TC	Technical Committee
MFCN	Mobile/Fixed Communication Network
NRA	National Regulatory Authority
VSP	Vertical Sector Player

References

[1] ETSI White Paper No. #57, Software Radio Reconfiguration: A modular Software Reconfiguration approach for radio equipment in general, Mai 2023, available at https://www.etsi.org/images/files/ETSIWhitePapers/ETSI-WP-57-A_modular_Software_Reconfiguration_approach_for_Radio_Equipment_in_general.pdf

[2] ETSI EN 303 641 V1.1.2 (2020-03), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) reconfiguration requirements

[3] ETSI EN 303 648 V1.1.2 (2020-03), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) reconfiguration architecture

[4] ETSI EN 303 681-1 V1.1.2 (2020-03), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) information models and protocols for generalized software reconfiguration architecture; Part 1: generalized Multi-radio Interface (gMURI)

[5] ETSI EN 303 681-2 V1.1.2 (2020-03), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) information models and protocols for generalized software reconfiguration architecture; Part 2: generalized Reconfigurable Radio Frequency Interface (gRRFI)

[6] ETSI EN 303 681-3 V1.1.2 (2020-03), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) information models and protocols for generalized software reconfiguration architecture; Part 3: generalized Unified Radio Application Interface (gURAI)

[7] ETSI EN 303 681-4 V1.1.2 (2020-03), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) information models and protocols for generalized software reconfiguration architecture; Part 4: generalized Radio Programming Interface (gRPI)

References

[8] ETSI TR 103 585 V1.2.1 (2019-11), Reconfigurable Radio Systems (RRS); Radio Equipment (RE) reconfiguration use cases

[9] ETSI EN 302 969 V1.3.1 (2018-05), Reconfigurable Radio Systems (RRS); Radio Reconfiguration related Requirements for Mobile Devices

[10] ETSI EN 303 095 V1.3.1 (2018-05), Reconfigurable Radio Systems (RRS); Radio Reconfiguration related Architecture for Mobile Devices

[11] ETSI EN 303 146-1 V1.3.1 (2018-06), Reconfigurable Radio Systems (RRS); Mobile Device Information Models and Protocols; Part 1: Multi-radio Interface (MURI)

[12] ETSI EN 303 146-2 V1.2.1 (2016-06), Reconfigurable Radio Systems (RRS); Mobile Device (MD) information models and protocols; Part 2: Reconfigurable Radio Frequency Interface (RRFI)

[13] ETSI EN 303 146-3 V1.3.1 (2018-06), Reconfigurable Radio Systems (RRS); Mobile Device (MD) information models and protocols; Part 3: Unified Radio Application Interface (URAI)

[14] ETSI EN 303 146-4 V1.1.2 (2017-04), Reconfigurable Radio Systems (RRS); Mobile Device (MD) information models and protocols; Part 4: Radio Programming Interface (RPI)

[15] ETSI TR 103 087 V1.2.1 (2017-11); Reconfigurable Radio Systems (RRS); Security related use cases and threats in Reconfigurable Radio Systems

[16] ETSI TS 103 436 V1.2.1 (2018-02); Reconfigurable Radio Systems (RRS); Security requirements for reconfigurable radios

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[17] ETSI TR 103 087 V1.2.1 (2017-11); Reconfigurable Radio Systems (RRS); Security related use cases and threats in Reconfigurable Radio Systems

[18] ETSI TS 103 436 V1.2.1 (2018-02); Reconfigurable Radio Systems (RRS); Security requirements for reconfigurable radios

[19] ETSI TS 103 154 V1.1.1 (2014-10); Reconfigurable Radio Systems (RRS); System requirements for operation of Mobile Broadband Systems in the 2 300 MHz - 2 400 MHz band under Licensed Shared Access (LSA)

[20] ETSI TS 103 235 V1.1.1 (2015-10); Reconfigurable Radio Systems (RRS); System architecture and high level procedures for operation of Licensed Shared Access (LSA) in the 2 300 MHz - 2 400 MHz band

[21] ETSI TS 103 379 V1.1.1 (2017-01); Reconfigurable Radio Systems (RRS); Information elements and protocols for the interface between LSA Controller (LC) and LSA Repository (LR) for operation of Licensed Shared Access (LSA) in the 2 300 MHz - 2 400 MHz band

[22] ETSI TS 128 301 V16.0.0 (2020-08); LTE; Telecommunication management; Licensed Shared Access (LSA) Controller (LC) Integration Reference Point (IRP); Requirements (3GPP TS 28.301 version 16.0.0 Release 16)

[23] ETSI TR 103 588 V1.1.1 (2018-02); Reconfigurable Radio Systems (RRS); Feasibility study on temporary spectrum access for local high-quality wireless networks

[24] ETSI TS 103 652-1 V1.1.1 (2019-02); Reconfigurable Radio Systems (RRS); evolved Licensed Shared Access (eLSA); Part 1: System requirements

[25] ETSI TS 103 652-2 V1.1.1 (2020-01); Reconfigurable Radio Systems (RRS); evolved Licensed Shared Access (eLSA); Part 2: System architecture and high-level procedures

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[26] ETSI - WInnForum Joint Whitepaper *"Spectrum sharing frameworks for temporary, dynamic, and flexible spectrum access for local private networks"*. 1st Edition – June 2023

[27] ETSI - TR 103 885 V1.1.2 ; Reconfigurable Radio Systems (RRS); *Feasibility study on existing spectrum sharing frameworks for temporary and flexible spectrum acces* – June 2023

[28] ETSI draft TS 104 011 V 0.0.9 (2024-06); Reconfigurable Radio Systems (RRS); Dynamic Spectrum Allocation Service (DSAS) System Requirements

[29] ETSI TR 103 587 V1.1.2 (2023-02); Reconfigurable Radio Systems (RRS); Feasibility study of a Radio Interface Engine (RIE)

[30] ETSI TS 103 655-1 V1.1.1 (2019-03); Reconfigurable Radio Systems (RRS); Radio Interface Engine (RIE); Part 1: Technical requirements

[31] ETSI TS 103 655-2 V1.1.1 (2021-02); Reconfigurable Radio Systems (RRS); Radio Interface Engine (RIE); Part 2: Architecture

[32] Webinar: Radio Reconfiguration - ETSI's approach and related RED regulation, 2021, available at https://www.etsi.org/events/1867-2021-02-webinar-a-modular-software-reconfiguration-approach-for-radio-equipment