ESSOR Programme Status & Contributions to SDR Architecture Standards

23.05.18

Agenda

1. ESSOR phase1: a won challenge

2. ESSOR OC1 – putting the mark higher

   - Technical content of ESSOR OC1

   - ESSOR support to SDR multinational interoperability

   - The ESSOR community

3. ESSOR Contributions to SDR Architecture Standards

4. Conclusions

1. ESSOR Phase1

A won challenge

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what is ESSOR

Intensive real-time Software development for interoperable radio communications

Hardware development (PTF) performed in National Programmes (full freedom on hardware choice by each PS)

Common products (Base Waveform , ESSOR Architecture, test tools) jointly developed

Freedom of each partner to use Common products but strategic decisions taken **jointly**

Focus on **interoperability** of the final products

Interoperable with national C4I systems

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ESSOR is

designed on PSs needs

ESSOR products are jointly developed by selected national industries based on a common set of requirements agreed by PSs. PSs support manage and control the evolution of ESSOR

Platform/vendor agnostic

ESSOR is designed not to constraint the choice of platform technological solutions

Knowledge sharing and build-up

*Even if the HDRWF is one of its pillar, ESSOR is way more than delivering a waveform: it is about creating a common **technology and knowledge.***
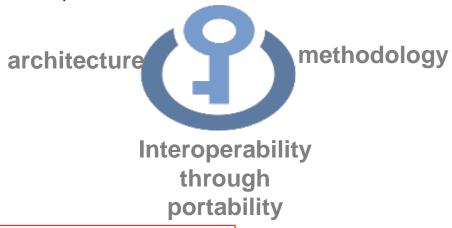
A growing community of interoperable partners

ESSOR is designed, developed and maintained with a strong focus on interoperability, with existing and potential new partners.
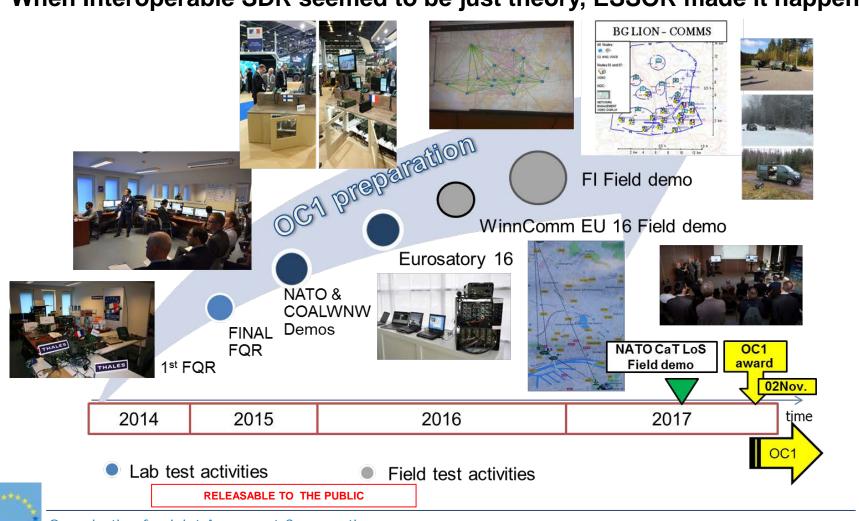
The ESSOR phase 1 provided

- a **common architecture,** shared by the Participating States

- a common ESSOR **methodology** which is a key to interoperability and Waveform portability.

- a **Wideband waveform** with advanced communication characteristics, the HDR WF

architecture   **methodology**

Interoperability through portability

A won challenge

When Interoperable SDR seemed to be just theory, ESSOR made it happen

OC1 preparation

FI Field demo

WinnComm EU 16 Field demo

Eurosatory 16

NATO & COALWNW Demos

FINAL FQR

1st FQR

BG LION – COMMS

NATO CaT LoS Field demo

OC1 award

02Nov.

| 2014 | 2015 | 2016 | 2017 | time |

OC1

Lab test activities   Field test activities

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2. ESSOR OC1

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ESSOR OC1 – ID card

what	**Learning from Experience**	analysis of the phase1 outcome
	Managing the change	technical enhancements to HDRWF
	Building coalition interoperability	support to standardization/adoption (ESSOR Architecture/HDRWF)
	Planning the future	TLM approach
Who	**Finland, France, Italy, Poland, Spain**	OC1 participating states (PSs)
	Germany	Joining the cooperation
	Sweden	ESSOR partner
	Third party countries	Perspective users (evaluating HDRWF)
when	**2018-2022**	ESSOR OC1
	2018 + 20 years	TLM strategic planning

ESSOR OC1 – Technical content

analysis of the phase1 outcome
starting point of new development

supporting the operational deployment

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ESSOR OC1 – Technical content

- **Push to Talk voice   (PTT)**
  CNR like voice
- **Radio Silence   (RSC)**
  improved EMCON/LPI
- **Cohabitation of networks   (COH)**
  deployable with other radio networks
  improved spectrum sharing

ESSOR HDRWF

HDRWF: secure interoperable wideband waveform

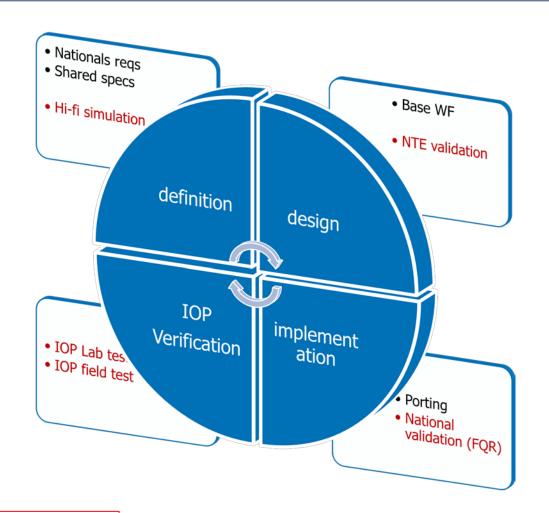| |
|---|
| UHF band |
| Up to 1 Mbps data rate |
| Frequency Hopping |
| 1.25 MHz bandwidth |
| IP data |
| Network synchronization with or without GNSS |

- Nationals reqs
- Shared specs
- Hi-fi simulation

definition

design

- Base WF
- NTE validation

IOP Verification

- IOP Lab test
- IOP field test

implementation

- Porting
- National validation (FQR)

ESSOR support to SDR multinational interoperability

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ESSOR OC1 – interoperability vision

The vision
ESSOR as interoperable communication enabler of a wide community of allies

The mission
designing a strategic roadmap based on the TLM study results for designing the future of ESSOR

The objective
deploy and use ESSOR OC1 for coalition operation

ESSOR OC1 – more than bits and bytes...

Through Life Management study (TLM)
- Supporting strategic planning for the future evolutions (not limited to current HDRWF perimeter)
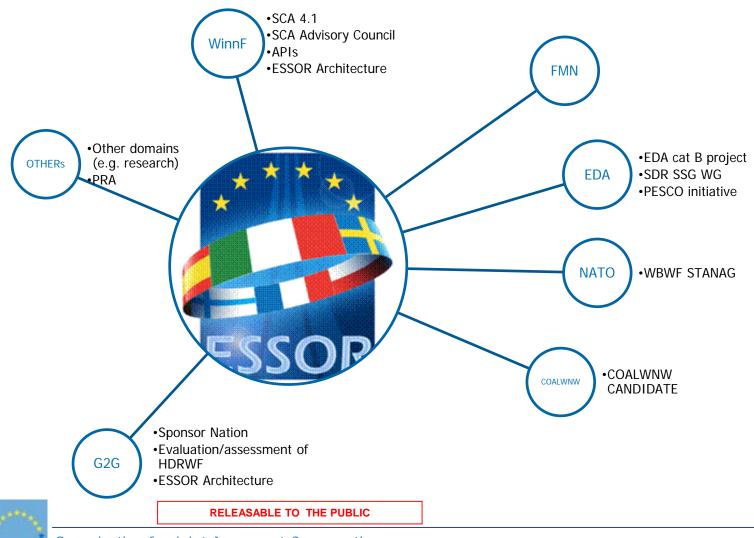
Information packages (MHS)
- Supporting the knowledge build-up and dissemination for enhanced interoperability with new partners
- Supporting other current strategic initiatives (e.g. FMN, PESCO) fostering joint development of new capabilities using HDRWF

Information package (PRA)
- Supporting Publication of ESSOR Architecture (Radio Devices / Radio Services) fostering knowledge build-up and international harmonization

ESSOR international commitment

WinnF
- SCA 4.1
- SCA Advisory Council
- APIs
- ESSOR Architecture

FMN

OTHERs
- Other domains (e.g. research)
- PRA

EDA
- EDA cat B project
- SDR SSG WG
- PESCO initiative

NATO
- WBWF STANAG

COALWNW
- COALWNW CANDIDATE

G2G
- Sponsor Nation
- Evaluation/assessment of HDRWF
- ESSOR Architecture

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ESSOR OC1 - interactions

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The ESSOR community

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ESSOR Programme

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ESSOR Stakeholders

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ESSOR Programme

ESSOR Stakeholders – ESSOR PD

- Established in Bonn (DE) since 15/12/2017

- 4 Members
  - Nicola Saracino   (Programme Manager)
  - Charles Chedhomme   (Contract Finance and PM support)
  - Fulvio Arreghini   (Technical Specialist)
  - Adrian Gonzalez Zorn   (Technical Specialist)

- Planned growth for integration of new partners

ESSOR.Questions@occar.int
get in contact with ESSOR PD
Request information/support in building knowledge on ESSOR

ESSOR events in 2018

Good opportunities to get in contact with ESSOR Community:

ESSOR PD:
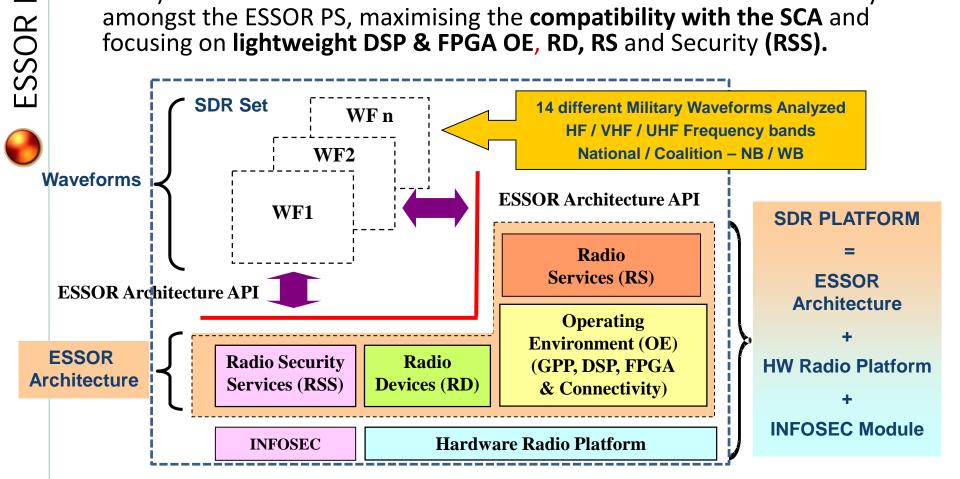- WinnComm Europe 2018
- EDA SSG SDR /PT CIS

ESSOR PS:
- CWIX 2018

3. ESSOR Contributions to SDR Architecture Standards

WInnF Conference Madrid

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ESSOR Architecture Overview

- The **ESSOR Architecture extends** the public part of **the SCA** (2.2.2 and API 1.0.3) and WINNF Transceiver API V1 in order to facilitate WF Portability amongst the ESSOR PS, maximising the **compatibility with the SCA** and focusing on **lightweight DSP & FPGA OE**, **RD, RS** and Security **(RSS).**

SDR Set

WF n

WF2

WF1

Waveforms

ESSOR Architecture API

ESSOR Architecture API

14 different Military Waveforms Analyzed
HF / VHF / UHF Frequency bands
National / Coalition – NB / WB

Radio Services (RS)

Operating Environment (OE) (GPP, DSP, FPGA & Connectivity)

ESSOR Architecture

Radio Security Services (RSS)

Radio Devices (RD)

INFOSEC

Hardware Radio Platform

SDR PLATFORM
=
ESSOR Architecture
+
HW Radio Platform
+
INFOSEC Module

SCA Standards Evolution

- The ESSOR Community contributed to SCA 4.1
  - SCA 4.1 **Application Environment Profiles (AEPs)**
  - SCA 4.1 **Interface Definition Language (IDL) (ultra-) lightweight profiles.**

- The ESSOR Community appreciates the **std. development efforts** performed in **WINNF SCA 4.1 WGs** for elaborating the SCA 4.1 specifications
  - **Backwards compatibility with SCA 2.2.2,** enabling **re-use of past WF developments** (as ESSOR HDRWF and National / NATO WFs)**,**
  - Integration of **significant contributions provided by ESSOR**,
  - **Normative reference to WINNF Std. "PIM IDL Profiles".**

- The ESSOR Community appreciates the **WINNF XCVR Next (V2) results.**
  - ESSOR Transceiver APIs released to WINNF CCSCA .

- The ESSOR Community is considering evaluating the impact of **WINNF Specifications** and **issued SCA 4.1** for **future enhancements of the ESSOR Architecture**, with the goal to **maintain the compatibility with the SCA.**

ESSOR Programme

- OCCAR / Participating States and ESSOR Industries have agreed inside the OC1 contract to have the Unclassified parts of the ESSOR Architecture "Releasable to the Public" focusing on:
  - ➢ Radio Devices (RD)
  - ➢ Radio Services (RS)

- The publication preparatory activities are currently running.

- Plan is to have the data package ready for Publication 1H 2019.

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a4ESSOR SAS Alliance for ESSOR
23/05/2018   WInnF Conference Madrid   RELEASABLE TO THE PUBLIC   25

ESSOR Programme

- **OCCAR-WInnF agreement** ("MoU") for the **exchange of information** in order to support the **harmonization of the Software Communication Architecture (SCA) standards at international level** is in place since beginning of 2016.

- ESSOR Transceiver APIs released to WINNF CCSCA.

- ESSOR supports WINNF "Federated Time Service API" harmonization efforts as essential complements to XCVR V2 API.

- ESSOR Timing Service API can be released to WINNF according to "Federated Time Service API" WG harmonization agenda, and agreement on the licensing terms.

4.conclusions

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Conclusions

ESSOR Phase 1 outputs and specially interoperability through Field Tests between different national PTFs was a **world's first success.**

ESSOR community is now preparing the **ESSOR OC1 deployment** on the field within a short timeframe**.**

TLM study results will give the basis to prepare the **20 years life** ESSOR products approach.

The ESSOR community is open to **welcome new partners from the** users and technological world.

OCCAR is **harmonizing** the different needs and is **managing** ESSOR Programme through its life cycle to ensure that our customers get the **expected benefits.**

ESSOR **welcomes WInnF efforts for Harmonization** of SDR Architecture.

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