SAVOIR

space avionics open interface architecture

Introduction and Status of SAVOIR

On behalf of the SAVOIR Advisory Group
Kjeld Hjortnaes – ESTEC/TEC-SW
Head of Software Systems Division

What is this all about.

- Improve the way we deliver space system
- Support industrial competitiveness
- Become more product oriented

The melting pot of ideas

Abolish Testing

New design tools

More software

Just smarter

Cheape

Miniaturisation

Meaner - Leaner

More standardisation

Hands on

Building blocks

Stronger management - Just

Design to spec

Desig

cost

Hands off

Less

ror by standards

Integrated teams

Shorter schedule

More hardware

Faster better cheaper

as you are told

subcontracting

ABOLISH REVIEWS

SAVOIR.

SAVOIR means ***S**pace **A**vionics **O**pen **I**nterface a**R**chitecture*.

It is an initiative to federate the space avionics community and to work together in order to improve the way that the European Space community builds avionics subsystems.

SAVOIR is coordinated by the Savoir Advisory Group including representative of ESA, CNES, DLR, Astrium, Thales, OHB, RUAG, Selex Galileo, Terma.

Motivation for the SAVOIR initiative

Improve the way we deliver Space Systems (cost & schedule) by

- **Pre-developed Products / Building Blocks based on**
- **Well defined Specification & Interfaces based on**
- **An agreed Reference Architecture**

SAVOIR objectives

- to reduce the **schedule** and **risk** and thus cost of the avionics procurement and development, while preparing for the future,
- to improve **competitiveness** of avionics suppliers,
- to influence **standardization** processes by standardizing at the right level in order to get equipment interchangeability (the topology remains specific to a project).
- to define the **governance** model to be used for the products, generic specifications, interface definition of the elements being produced under the SAVOIR initiative.

The process is intended to be applied as part of the Agencies ITTs, and throughout the subsequent procurements and development process. A particular goal is to have Savoir outputs exploited in future projects and relevant products as part of European supplier's portfolios.

SAVOIR Output

The primary outputs of Savoir are:

- **reference avionics architecture** for spacecraft platform hardware and software,
- a set of avionics external and internal **interface specifications**,
- the definition of building blocks composing the architecture,
- the **functional specification** of selected building blocks comprising the architecture,
- the implementation of selected building blocks at the right TRL level,
- process definition and assessment.

Example of SAVOIR output:

- input to the harmonization process
- definition of reference architectures for avionics and software
- generic specification of CDMU

SAVOIR expected benefits

SAVOIR supports:

- the space avionics **customers** and **system architects**,
- the **system integrators**,
- the avionics and technology **suppliers**,
- the standardization bodies.

It is a tool for the industrial policy and R&D planning makers

The expected benefits of SAVOIR are:

- for **customers**, streamline the procurement process of spacecraft avionics,
- for **system integrators**, facilitate the procurement and integration of the spacecraft avionics,
- for **suppliers**, prepare the technical conditions for an efficient product line organization.

Organisation

SAVOIR
space avionics open interface architecture

SAVOIR Advisory Group

SAVOIR FAIRE
space avionics open interface architecture

Software reference architecture

SAVOIR SAFI
space avionics open interface architecture

Sensor/Actuator Functional Interface

SAVOIR SAIF
space avionics open interface architecture

Electrical interface (Data & Power)

Sub-domain Working groups

SAVOIR perimeter

- SAVOIR focus on the Platform Avionics including Payload Interfacing
- Build on 4 pillars
  - Data Handling Hardware
  - Control Sensors & Actuators
  - On-board Communication
  - Flight Software
- Potential extension
  - Power systems
  - The operations view
  - Design for AIV/AIT

The SAVOIR wheel

Domain of reuse

Agree on which functions compose the perimeter of avionics and how to allocate them to BB if needed.

Domain design

Agree on the most important BB to standardize and develop. Propose a roadmap to implement them.

System Reference Architecture 1

Define Interface (**IRD**)

Building Blocks 2

Refine Interface (**ICD**)

Product Use Assesment 4

Reference Functional Specifications 3

SAVOIR is an initiative to federate the space avionics community to work together in order to:

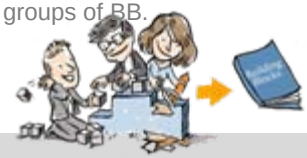
- Improve the way to deliver space programs (cost & efficiency).
- Set a « product philosophy » approach.
- Deliver elements usable by the customers, the system integrators and the suppliers.

Key Performance Indicators

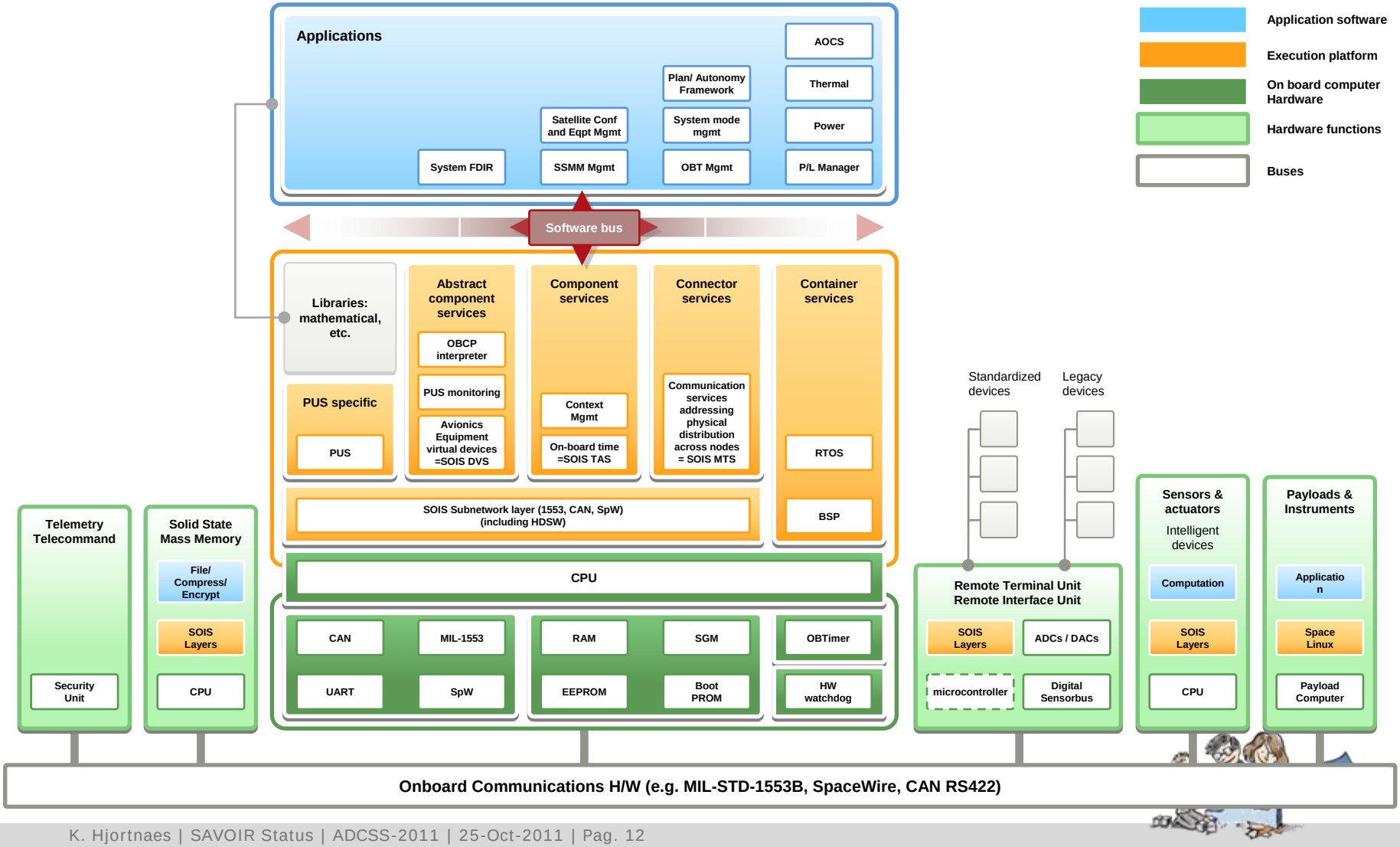
Measure the effectiveness of SAVOIR recommendations and approach, in terms of costs and effectiveness.

Reusable spec & I/F standards

Agree on variability and modularity of the specifications for the selected BB or for groups of BB.



The avionics reference architecture (HW + SW)



SAVOIR

- Phase-1: Concept definition
  - Establish consensus of common goal – concept definition
  - Define the perimeter
  - Establish product orientation, while still respecting individual commercial interests.
  - Strive for standardisation without killing innovation.
- Phase-2 (2011 →) From concept to implementation
  - Priorities - Choices (select building blocks)
  - Details – Formalism (produce generic specs)
  - Maturity (verify consistency – completeness)
  - Cost – Schedule (development plan)

ADCSS-2011, SAVOIR Session

- Disseminate the SAVOIR results and plans to the European Space Community.
- Solicit feedback / opinions / views / criticism from all stakeholders in the European Space Community.
- The round-table will specifically query the end-users view.

"Are we building the right thing?"

And as second objective

"Are we building it right?"

Contact

Feedback: savoir@esa.int

SAVOIR Advisory Group:

- Kjeld Hjortnaes – ESTEC/TEC-SW
- Philippe Armbruster – ESTEC/TEC-ED
- Alain Benoit – ESTEC/TEC-EC
- J. Miro – ESOC/OPS-G
- P. van Troostenberghe – CNES
- T. Wolf – DLR
- T. Duhamel – Astrium
- J. Busseuil – ThalesAleniaSpace
- B. Bruenjes- OHB
- C. Jørgensen – Terma
- T. Hult – RUAG
- F. Boldrini – Selex Galileo