SAVOIR MASAIS status
ADCSS 2017

TEC-ED/SW ESA-ESTEC Data System & Software Divisions

Agenda

- General presentation of SAVOIR-MASAIS
- SAVOIR Data Storage System Requirement Document
- SAVOIR Data Storage Generic Interface and Service Requirement Document

Savoir-MASAIS Tasks

- The SAVOIR-MASAIS Working Group has as main goal the definition of the functional, performance, operational and interface requirements of the Data Storage function and its management (SAVOIR Mass Memory specification).

- The first step aims at analysing the existing SRD/OIRDs to consolidate system/operability requirements. This has been done by gathering agencies and primes in a Working Group to issue SRD/OIRD issue 0
- The second step consists in the review the SRD/OIRD requirements and in the contribution to the definition of the functional, performance, operational and interface requirements of the on-Board Mass Memory function and its management (S/s or Unit Specification) in interaction with the File Management System Interface Standardization (FMSIS) TRP activity (TEC-SW). The Working Group has been extended to data storage solution providers (HW and SW).

SAVOIR-MASAIS Members

Andrea	Accomazzo	ESA
François	Bonnet	CNES
Stefan	Bormann	OHB-System
Arnaud	Bourdoux	Spacebel
Yoann	Charnet	Airbus-DS
Michele	De Meo	TAS
Mark	Dean	ESA
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Fabian	Greif	DLR
Ignacio	Herrera	Airbus-DS
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Peter	Holsters	Qinetiq
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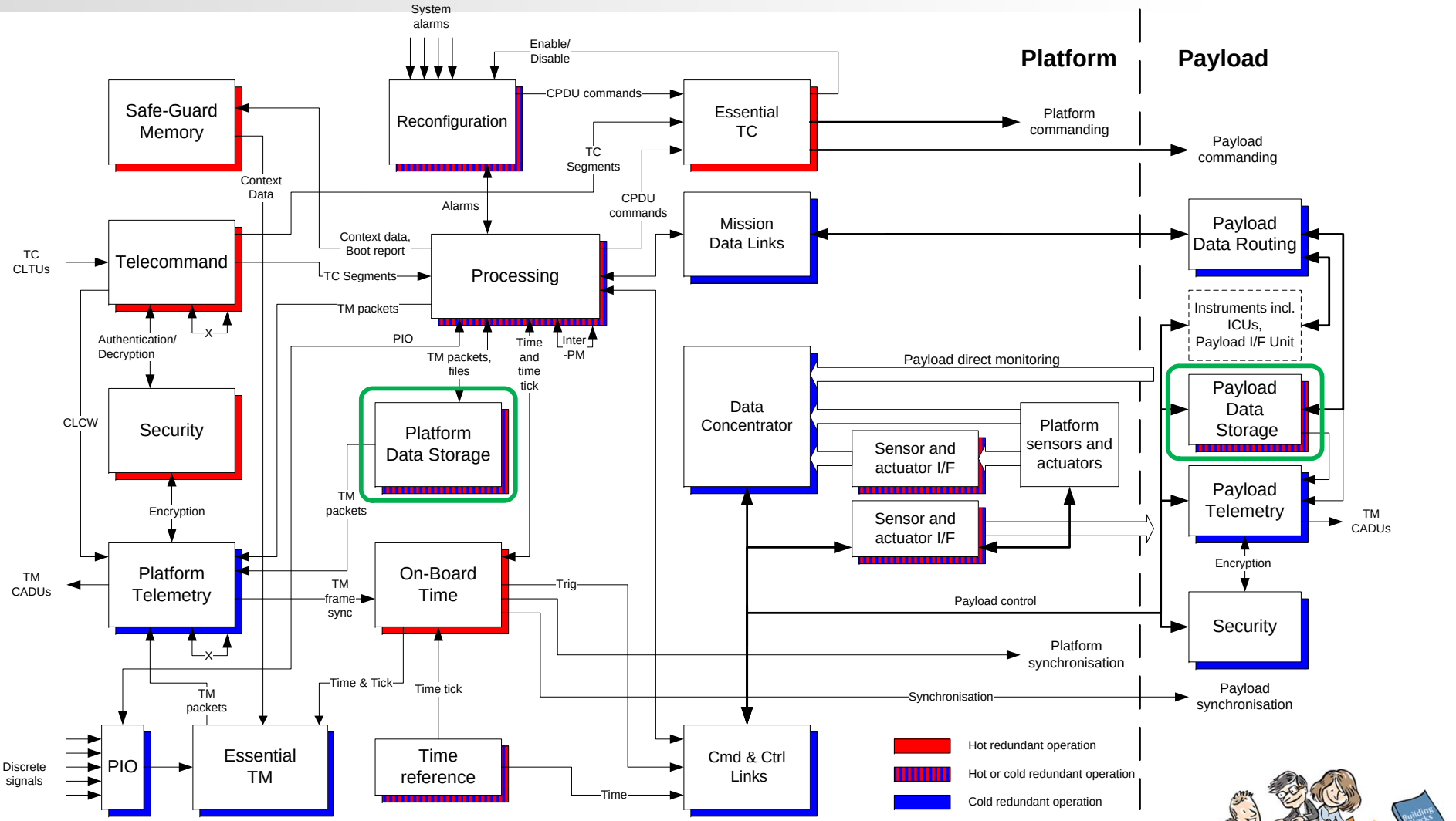
Guido	Rosani	TAS
Patrik	Sandin	RUAG
Jean-Francois	Soucaille	Airbus-DS
Dietmar	Walter	DSI-IT

Reviews by SAVOIR

- The following FMSIS documents have been distributed to SAVOIR-MASAIS and SAVOIR Advisory Group for review:
  - TN2: System Requirements (SRD/OIRD)
  - TN4: SAVOIR Mass Memory specification
- The documents are available
  - on the SAVOIR-MASAIS Alfresco website
  - on the “TEC-SW public documents” Alfresco website
- TN2 has then been translated into a SAVOIR document and distributed to SAG for review. Comments (50+) have been answered and an updated version is ready.
- TN4 will be translated into a SAVOIR document in Q4 2017 and a public review will be organized.

SAVOIR Reference Architecture



SAVOIR Data Storage SRD Content

- What it contains:
  - “Everything” required to store and access data on-board (and more):
    - Generic requirements
    - Interface requirements
    - Organization
    - Packet Management System
    - Performances
    - FDIR
- What it does not contain:
  - Everything that is linked to usage of the stored data:
    - Operabilty requirements (to be provided in OIRD), e.g. CFDP
    - File format (organisation of data contained in files).
    - …

SAVOIR Data Storage SRD
Generic requirements

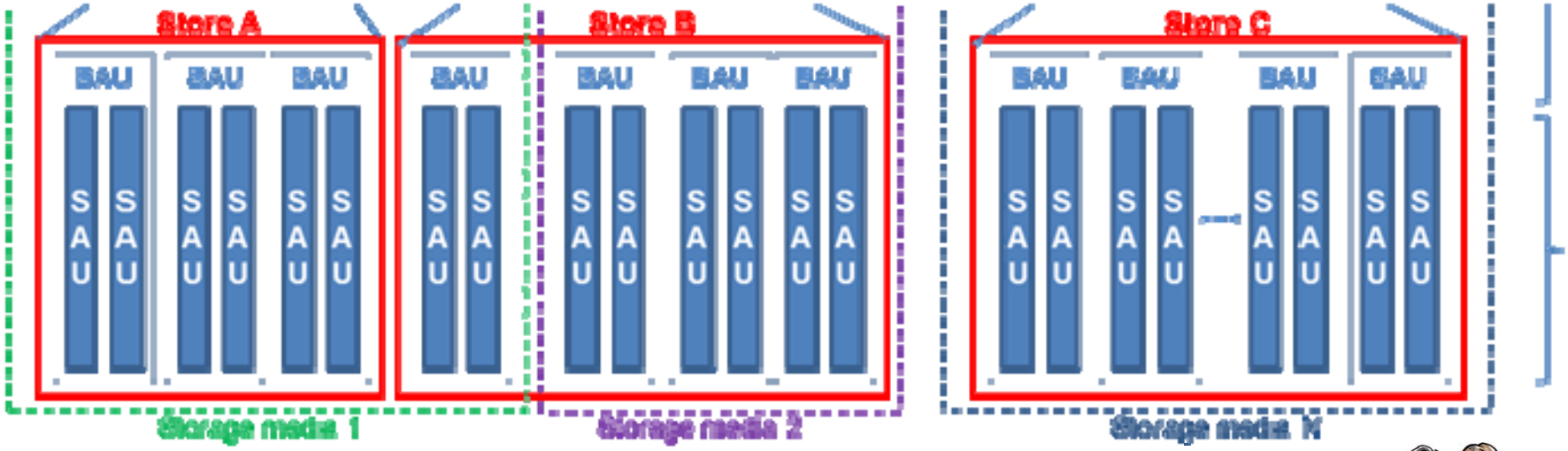
- Capabilities
  - Storage relying on concept of Storage Medias
  - Read and write accesses
  - Capacity
  - Protection
- Composition:
  - Rely on storage medias with volatile or non-volatile memory
- Needs:
  - Access on-board time

SAVOIR Data Storage SRD
Interface requirements

- Service: Support of PUS
  - Service 1 - request verification
  - Service 2 - device access
  - Service 3 – housekeeping
  - Service 5 - event reporting
  - Service 6 - memory management
  - Service 15 - on-board storage and retrieval
  - Service 17 - test
  - Service 20 - parameter management
  - Service 23 - file management
- Communication
  - 1553, SpaceWire, CAN

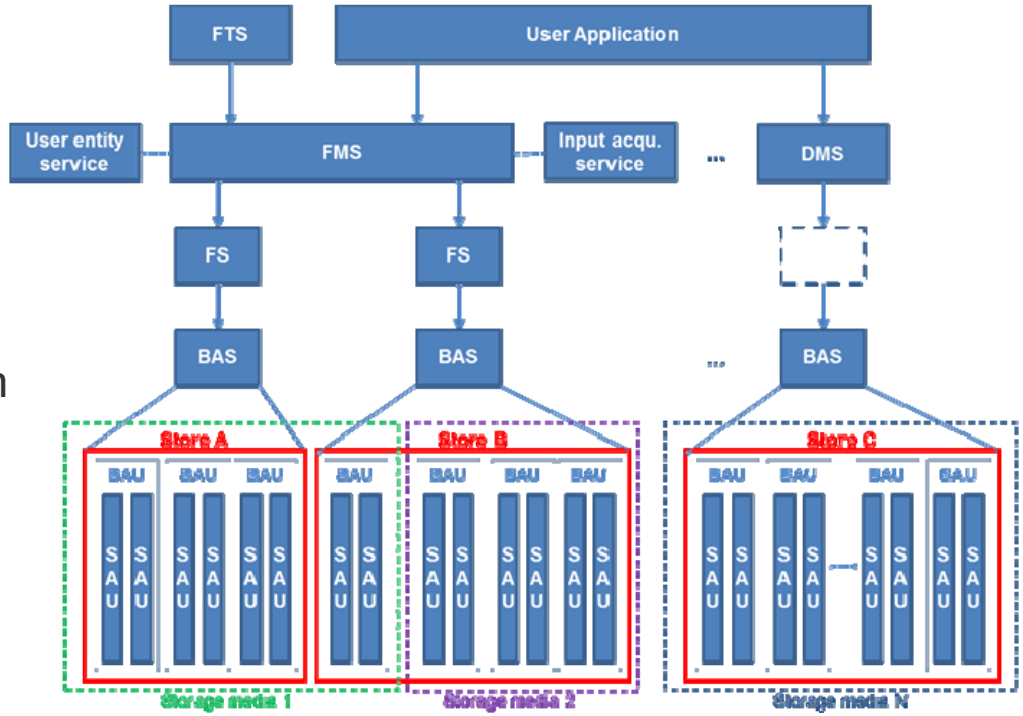
SAVOIR Data Storage SRD
Organisation - Hierarchical Storage

- Storage media: any device that can be used to store data.
- Smallest Addressable Units (SAU) : the smallest unit of memory addressable/accessible within a Storage Media.
- Block Access Unit: logical data unit consisting in a collection of SAUs.
- Store: Logical decomposition of the overall data storage capability, i.e. collection of BAUs of same or distinct Storage medias.



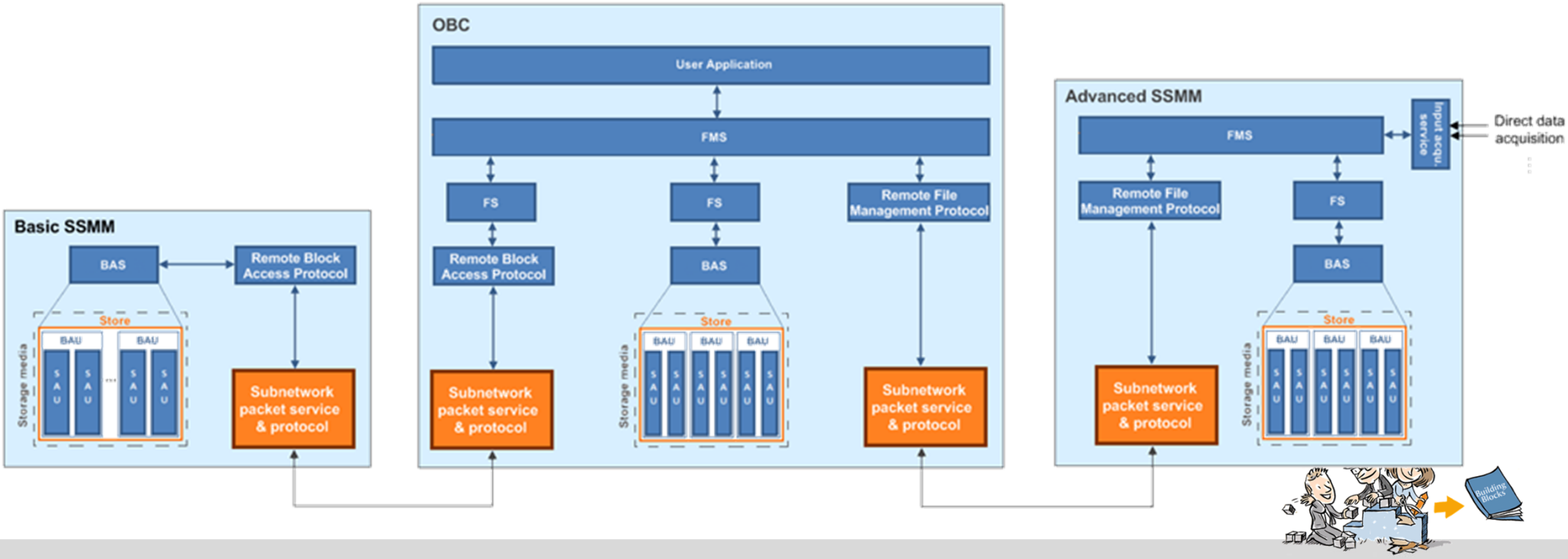
SAVOIR Data Storage SRD Organisation - Hierarchical Access

- Block Access Service: access to BAUs.
- File System: access to files and directories.
- File Management System: access to several File Systems. Provide capabilities and services needed by PUS Service 23 needs.
- Packet Management System: Relies on ECSS-E-ST-70-41C PUS Services 13 and 15.
- Data Management System: High-level logical organisation covering one or several data, packet or file management systems. FMS and PMS are instantiation of DMS.



SAVOIR Data Storage SRD
Organisation – Distributed architecture

- Storage medias can be local (on same equipment that the User of the data storage) or remote (on a different equipment that is connected by a communication link).
- Storage medias can be basic (only managing block accesses) or advanced *(able to support FMS)*.



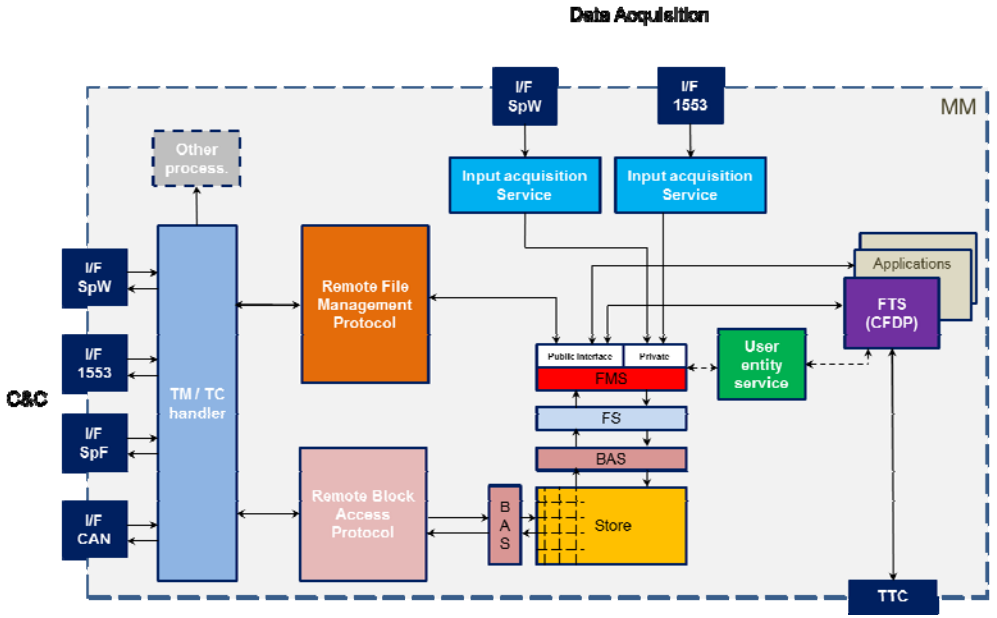
SAVOIR Data Storage SRD
Performance and FDIR

- Performance aspects to be instantiated by missions:
  - Capacity
  - Bit Error Rate
  - Failure In Time
  - Data throughput
  - Commanding rate
  - HKTM rate
  - Concurrent use
  - Initialisation time

- FDIR aspects:
  - Detection and reporting capability
  - Self-tests
  - Management of errors
  - Recovery of errors

SAVOIR Data Storage Generic Functional and Interface Requirements

- Topics
  - Concepts
  - Generic requirements
  - Interface requirements
  - Data Storage Organization (Store, File Store, Packet Store)
  - File Management System Service (Definition, parameters, interface and concurrency management
  - Performances
  - FDIR



- Still to be done
  - Consolidation w.r.t. SOIS status
  - Remove requirements related to operations (link to OIRD).

SAVOIR MASAIS
Conclusion

- SAVOIR Data Storage System Requirement Document is ready to be published and considered by projects.

- SAVOIR Data Storage Generic Functional and Interface Requirements still need some work. It will be reviewed by SAG early 2018 and a public review will be organized. Final version is expected for ADCSS 2018.