



Status ADCSS 2020



Savoir-MASAIS Working Group



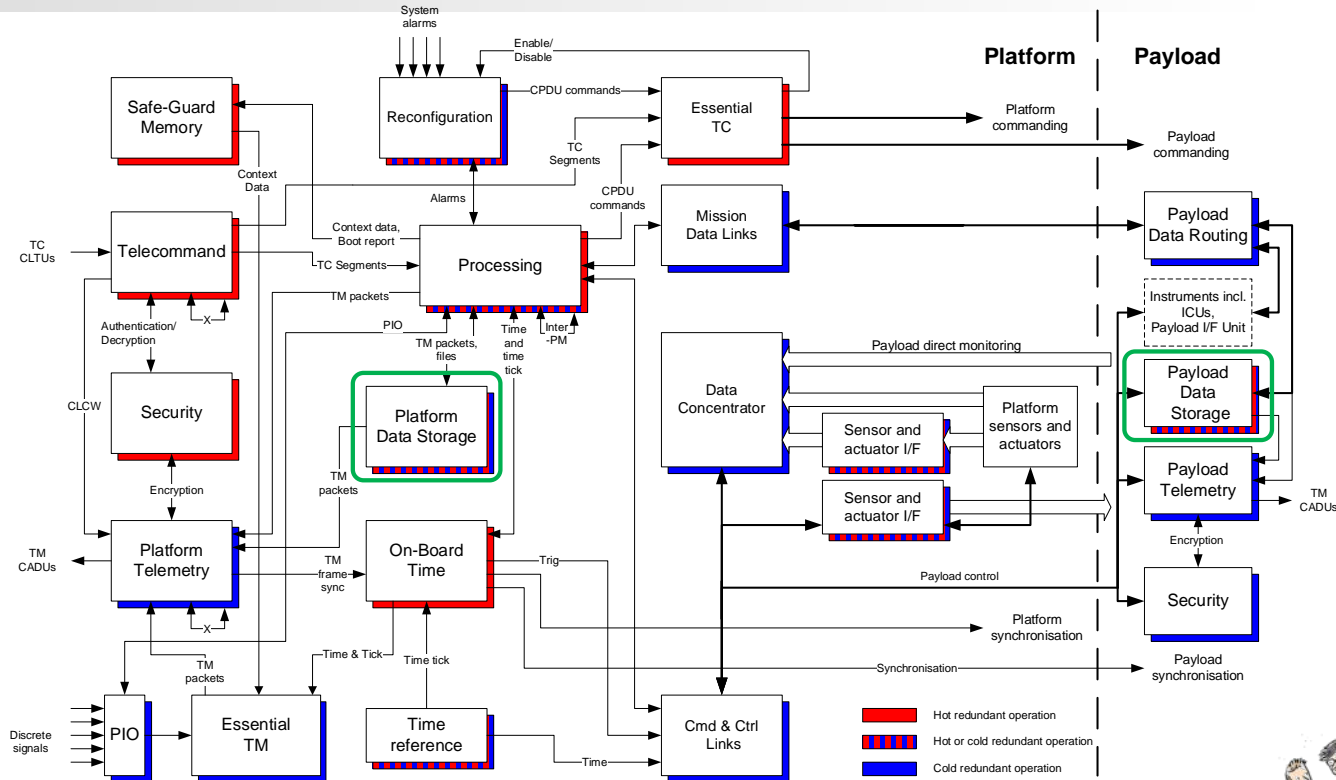
- The SAVOIR-MASAIS Working Group has as main goal the definition of the functional, performance, operational and interface requirements of the Data Storage function and its management.

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TO BE UPDATED



SAVOIR Reference Architecture



SAVOIR Data Storage System Requirement Document



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

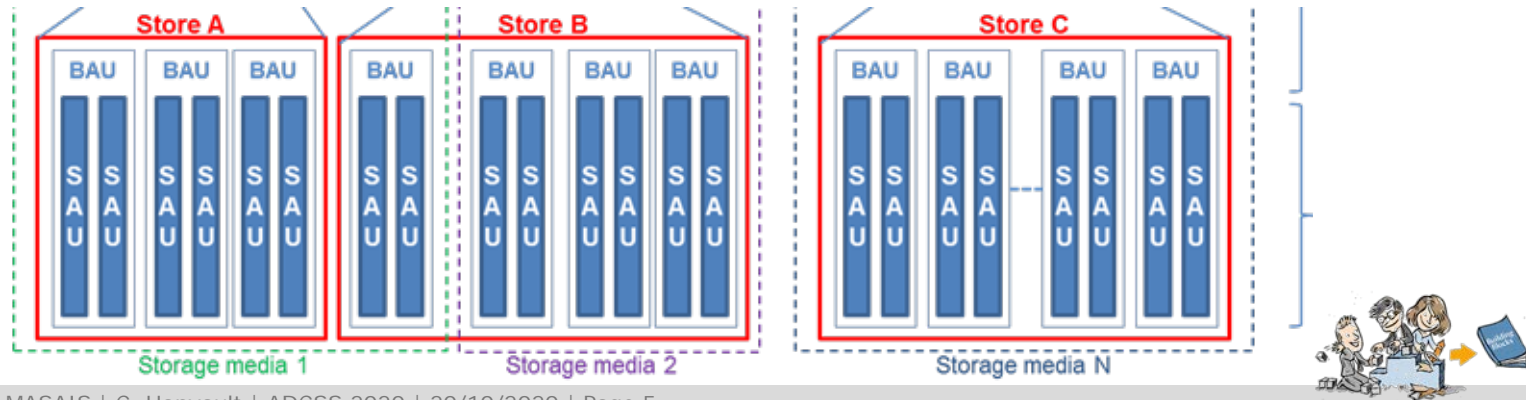


SAVOIR Data Storage SRD

Organisation - Hierarchical Storage



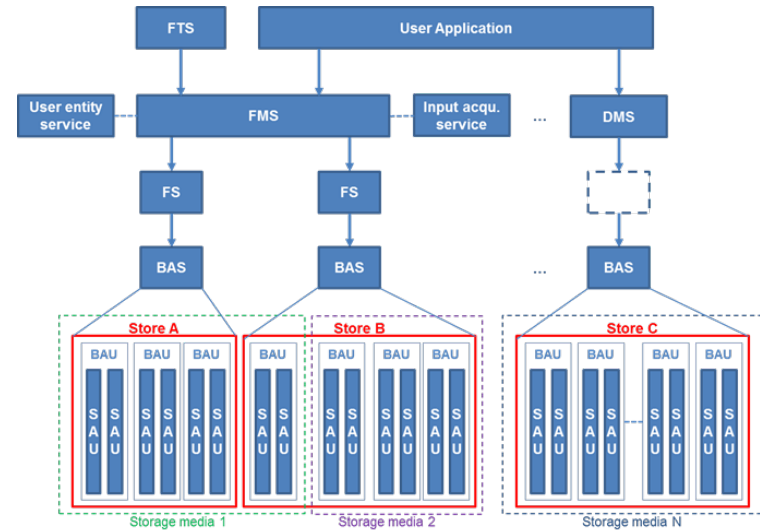
- Storage media: any device that can be used to store data.
- Smallest Addressable Units (SAU) : the smallest unit of memory addressable within a Storage Media.
- Block Access Unit: logical data unit consisting in a collection of SAUs.
- Store: Logical decomposition of the overall data storage capability,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

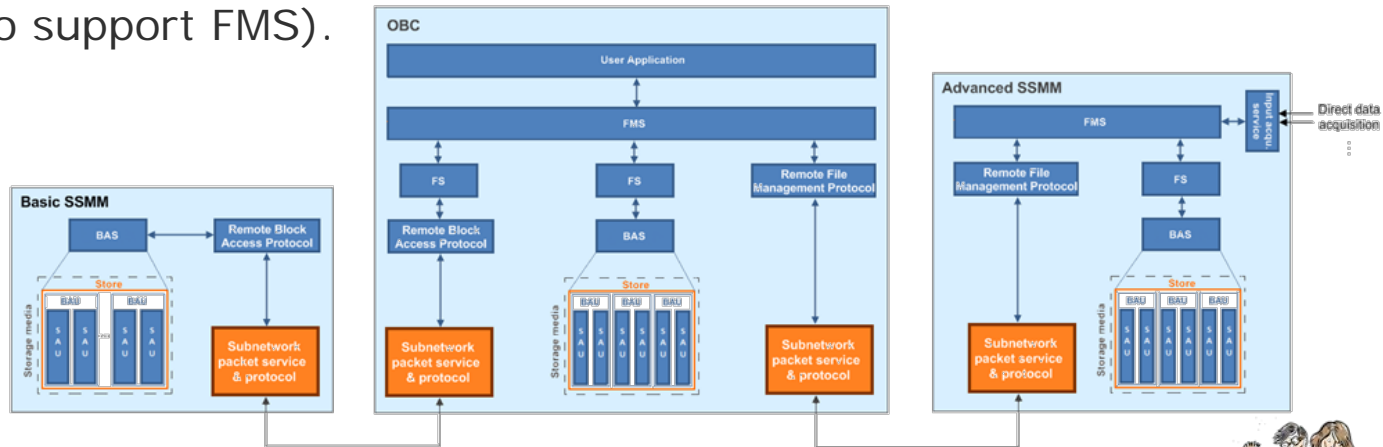


SAVOIR Data Storage SRD

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 Service and Interface Requirement Document



- Concepts
- Generic requirements
- Interface requirements
- Data Storage Organization
- Data Storage Services
 - Block Access Services
 - Store Services
 - File Management System Services
 - Performances
 - FDIR
 - User Entity Services



SAVOIR Data Storage SIRD Block Access



- Define all services required to manage Block
 - READ_BAU
 - WRITE_BAU
 - ERASE_BAU
 - DISABLE_BAU
 - ENABLE_BAU
 - LOCK_BAU
 - UNLOCK_BAU



SAVOIR Data Storage SIRD

Store management



- Define all services required to manage Stores
 - CREATE_STORE
 - DELETE_STORE
 - EXPAND_STORE
 - REDUCE_STORE
 - LOCK_STORE
 - UNLOCK_STORE
 - ERASE_STORE
- Services are using list of BAUs in order to maximize the flexibility.
- List of contiguous BAUs can be used to ease implementation.



SAVOIR Data Storage SIRD

File management



- Define all services required to manage Files
 - CREATE_FILE
 - OPEN_FILE
 - MAP_FILE
 - CLOSE_FILE
 - WRITE_TO_FILE
 - READ_FROM_FILE
 - SEEK_FILE
 - SHRINK_FILE
 - GET_FILE_STATUS
 - SET_FILE_ATTRIBUTE
 - GET_FILE_ATTRIBUTES
 - FORCE_FILE_SYNCH
 - GET_FILE_CHECKSUM
 - DELETE_FILE
 - COPY_FILE
 - SUSPEND_FILE_COPY
 - RESUME_FILE_COPY
 - ABORT_FILE_COPY
 - GET_FILE_COPY_STATUS
 - MOVE_FILE
 - REGISTER_FMS_EVENT
 - UNREGISTER_FMS_EVENT
 - CREATE_DIR
 - LIST_DIR
 - DELETE_DIR
 - RENAME_DIR
 - LOCK_FILE
 - UNLOCK_FILE
 - LIST_LOCKED_FILES
 - FIND_FILES
 - SET_DIR_ATTRIBUTE
 - GET_DIR_ATTRIBUTES
 - GET_BAU_LIST
 - FILE_DEFRAGMENTATION
 - MAP_FILE_SPLIT



What next?



- A Technology Development Element (TDE) activity
 - Reference: T702-702SW
 - Title: SAVOIR File Management System
 - Date: To be issued in 2021
 - Objectives:
 - Development of a generic File Management System library
 - Available under ESA Community License
 - Running on modern On-Board Computer equipment
 - Able to manage modern Mass Memory equipment
- Should be linked to ADHA TDE activities to be issued in 2021:
 - T701-703ED - ADHA On-Board Computer Module (AOBCM)
 - T101-701ED - ADHA Mass Memory Module (A3M)
- Specification of the remote Block Access Service and File Management Service protocols



SAVOIR MASAIS

Conclusion



- SAVOIR Data Storage System Requirement Document has been published on the European Space Software Repository (ESSR - <https://essr.esa.int/project/savoir>). Reference is SAVOIR-GS-004.
- SAVOIR Data Storage Service and Interface Requirements is currently under review by SAG (and SAVOIR-MASAIS). Reference is SAVOIR-GS-008.
- Data Storage users and providers are invited to join SAVOIR-MASAIS.
- TDE “SAVOIR File Management System” will be issued in 2021
- Projects are encouraged to apply the SAVOIR Generic Specifications with appropriate tailoring.

