ABS: Archives Building Systems Infrastructure:
- Common Scientific Archives Architecture
- Set of tools and libraries
- State of the art technology
- Three tier architecture
- Quick building and deployment
- Easy maintenance.

ESA New Generation Science Archives (II) : Data Layer

Query Manager Module → Metadata Access
- Handle all requests collected with metadata information using state of the art software, such as
  - Connection Pooling
  - Statement Pooling
  - Distributed Query & Objects Cache
- Composed of five different modules:
  - Query Handler
  - Query Builder
  - Geometry Handler
  - Result Handler
  - Data Access Objects (DAOs)

Geometry Handler
- Relates an input or a set of inputs from the DAO layer and binder them to the corresponding project dependent object
- Objects are recognized as simple (string, integer) or complex elements of the project.

DAO (Data Access Object) Layer
- The DAO layer encapsulates access to stored metadata
- Robustly keeping relationships used for several accesses
- Keeps database tables in persistent state
- Provides data layer and distributed functionality
- Manages database with state of the art software
- Uses database technology to provide additional functionality through the following modules
  - Query Manager Module
  - Data Distribution Module

Query Handler
- Point of entry for all requests of the Query Manager
- Requires processing step
  - Call Query Builder to build a Query Object (if needed)
  - Call the corresponding DAO
  - Process the result with the Result Handler (if needed)
  - Give back the results

Query Builder
- Receives a QueryBean object and returns an equivalent object which can be understood by the DAO Layers
- If there are any geometrical conditions, the Geometry Handler is called in order to add to the final query
- The correspondence between the QueryBean entities and the database tables is achieved by the use of xml mapping
- After the database entities, the Olijska algorithm is used to "join" and extract the requested attributes. The Olijska algorithm, conceived by Edsger Dijkstra in 1959, was chosen because:
  - It is a graph search algorithm that finds the shortest path problem for a graph, including a priori constraints, which is often used in database.
  - It can be applied to our database tables and their relationships.

Result Handler
- Receives an object or a set of objects from the DAO layer and binder them to the corresponding project dependent object
- Objects are recognized as simple (string, integer… ) or complex elements of the project.

Data Distribution Module → Data Access
- Handles all requests related to repository files
- Data can be requested at different granularity levels, dependant upon the project
- Once the module has the data requested, a HTTP URL will be provided to the user for easy data access. This URL is internally redirected to an FTP server.
- Data available in FTP holding area, accessible from HTTP (redirected)
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- Retrieval of postcards, when available, is treated as a synchronous request.
- Asynchronous sequences can be performed by data order retrieval of postcards

Use Case: Soho Science Archive
- 3 levels of granularity in metadata display & data retrieval
- 142422 observations in the database
- 760366 control images in the database
- 25464 full data cube images in the database
- 139777 files in the data repository
- http://soho.esac.esa.int/data/archive/index_ssa.html

EXOSAT Science Archive (coming soon)
http://www.sciops.esa.int/index.php?project=SAT