Target for LOFAR Long-Term Archive

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The radio interferometric array of LOFAR consists of 48 stations spread over the North of Europe. Each station has a number of fields with many low-cost antennas. The core stations are distributed over an area of about 100 kilometers in diameter in the North-East of the Netherlands. Several international stations have been built in Germany and the UK, and stations in Sweden and France are in the making. LOFAR will generate several Petabytes of data each year. These data are stored into a distributed Long-Term Archive (LTA), in which the Target technology and infrastructure play a crucial role.

Due to inflow of new observations and reprocessing of already archived data the total data volume will increase up to 25 PB by the end of 2014.

10 GbE WAN

Blue Gene/P 34 Tflops

Tier 0

Tier 1

Distributed Archive
Grid, GPFS

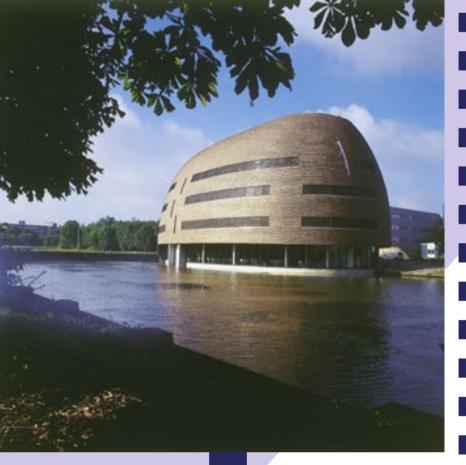**Metadata Database**

Jülich
FZ Jülich
up to 1 PB Grid storage

Amsterdam
SARA
up to 3 PB Grid storage

up to 10 PB GPFS storage
High Performance Computing

Groningen
Target

Tier 2

User Interfaces
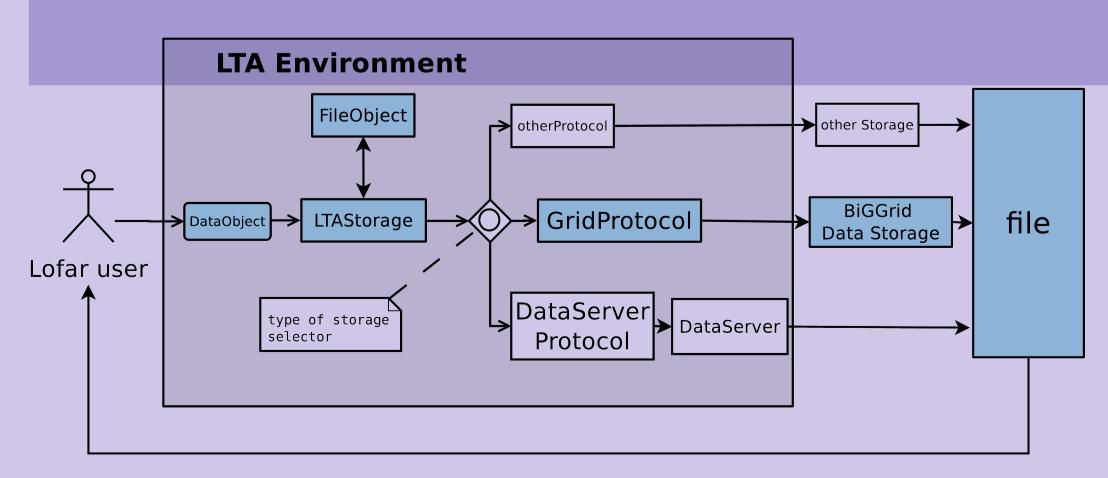
LOFAR Long Term Archive:
- Multi-Tier architecture
- Groningen, Amsterdam, Jülich and beyond
- Grid storage (EGI Grid), GPFS (Target)
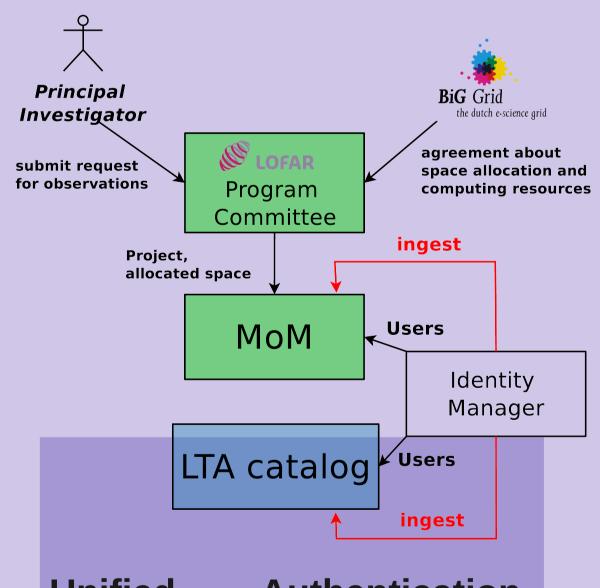- Metadata database (Target)
- User interfaces (Target)

Integrated Grid and non-Grid storage
Each data entity is stored in LTA as a file that is registered in LTA metadata database with a unique filename.
The LTA environment created from Astro-WISE allows to store multiple copies of the same data entity. The data file can be stored on Grid (EGI Grid), Astro-WISE dataserver or GPFS filesystem (Target). The file is registered in LTA with a number of URIs. The DataObject class defines how and where the file is stored, an instance of the FileObject class is created for each copy and stores an URI of the file.
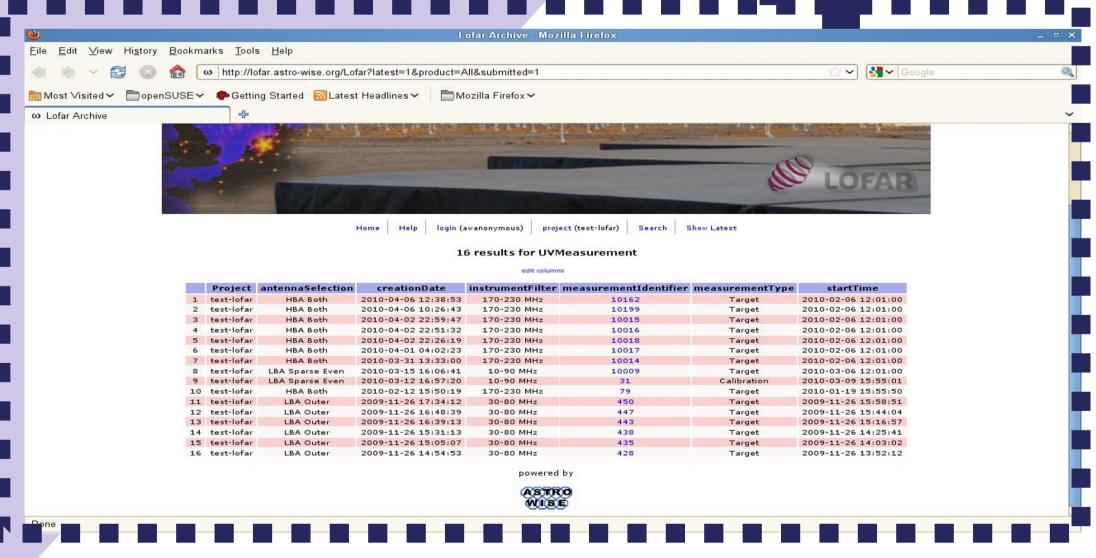The user can retrieve the file from the preferred location.

LTA Environment

Unified Authentication and Authorization System
Authentication and Authorization System (A&A) synchronizes A&A of LOFAR observatory and LTA.
The MoM (Management of Measures) system on Tier 0 contains the definition of each project and all LOFAR users assigned to the project. The Novell Identity Manager instance binds the identification of users of LOFAR observatory with the identification at LTA.

Target/Astro-WISE features for the LTA:
- LoWISE: Astro-WISE technologies extended to PB-scale
- Integrated storage and processing facilities
- Integrated Grid and non-Grid storage
- Unified Authentication & Authorization system
- In-depth data mining with metadata database
- Reprocessing of any data product
- Common Data Model
- Distributed archive

http://lofar.astro-wise.org

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