I3S participation to Life Sciences cluster EGEE-III NA4

Johan Montagnat

Orsay, June 10, 2008

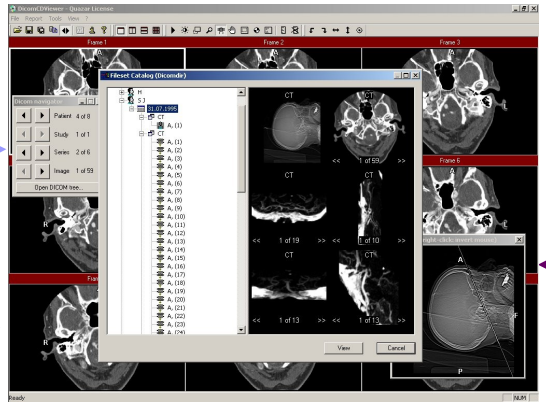
www.eu-egee.org

e-infrastructure

EGEE Medical Data Manager

- **Objectives**
  - Expose a **standard grid interface** (SRM) for **medical image servers** (DICOM)
  - Use native DICOM storage format
  - Fulfill medical applications security requirements
  - Do not interfere with clinical practice

DICOM clients



DICOM server

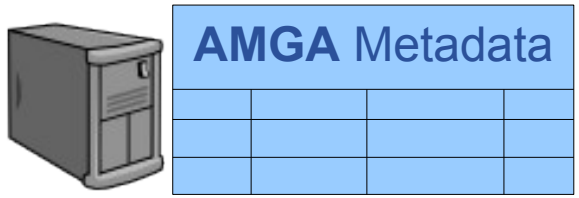
DICOM Interface SRM

Worker Nodes

User Interfaces

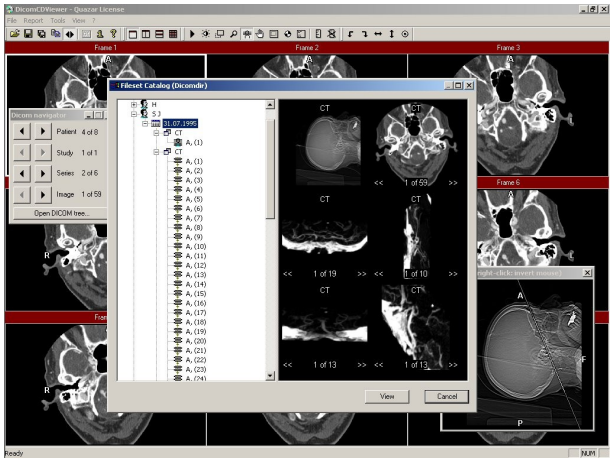
MDM Components

- **Usability**
  - **LFC API** provides **transparent** access
- **Privacy**
  - **LFC and DPM** provide file level **ACLs**
  - **AMGA** provides metadata **secured communication** and **ACLs**
- **Data protection**
  - **SRM-DICOM provides on-the-fly data anonimization**
    - **DPM-based (SRM v2 interface)**
  - **Hydra** key store provides encryption / decryption **transparently**
  - Data is anoymized prior to transmission



Medical Data Registration

1. Image is acquired



2. Image is stored in DICOM server

DICOM server

DPM

3. gLite client

gLite CLI

4. image metadata are registered

AMGA Metadata

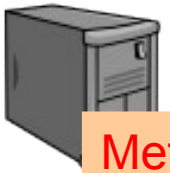
3a. Image is registered (a GUID is associated)

LFC File Catalog

3b. Image key is produced and registered

Hydra keystore

Medical Data Retrieval



AMGA Metadata

Metadata ACL control

1. get GUID from metadata

Worker Node

User Interface

2. lcg client

LFC

File Catalog

File ACL control

gLite CLI

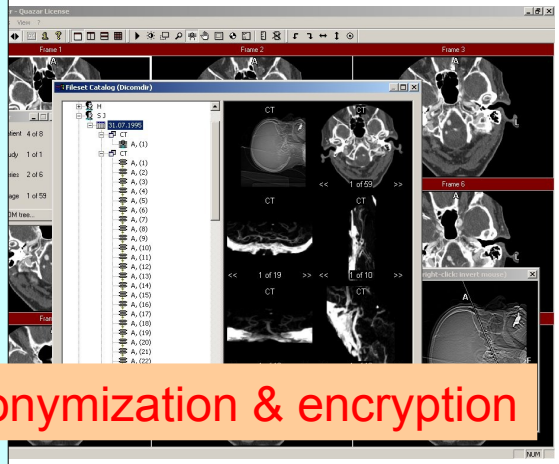
3. get SFN from GUID

4. request file

7. get file key and decrypt file locally

6. on-the-fly encryption and anonimyzation return encrypted file

SRM-DICOM interface



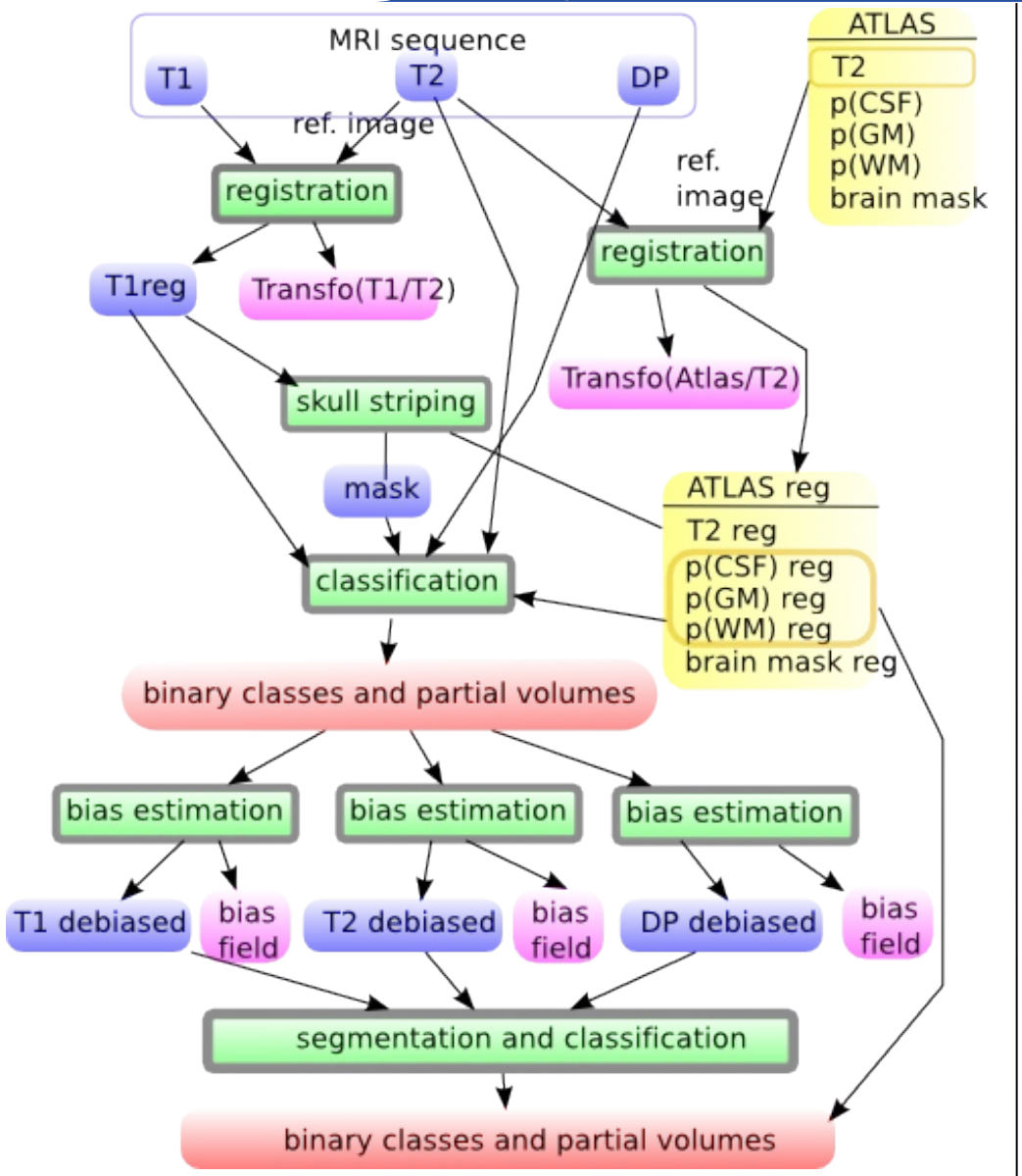
Anonymization & encryption

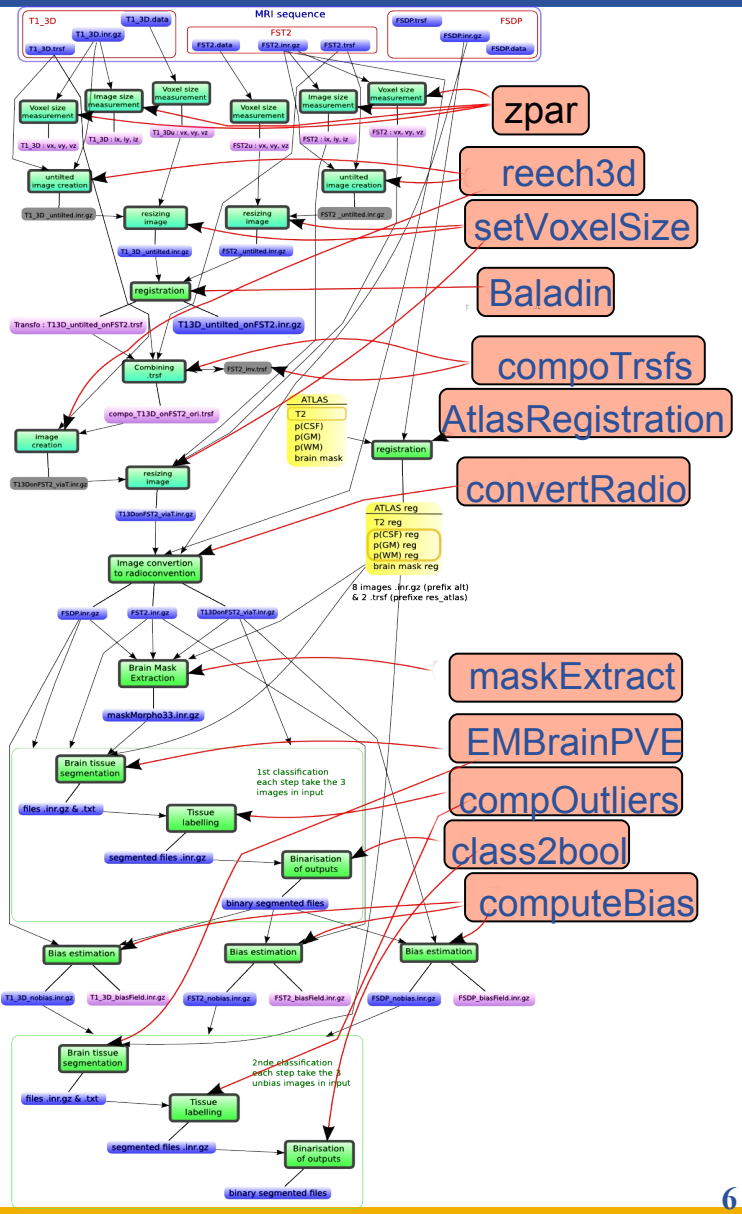
Key ACL control

Hydra keystore

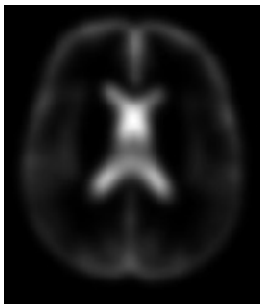
5. get file key

MS analysis pipeline



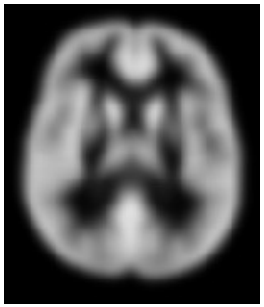


MS lesions identificaiton



CSF atlas

WM atlas



GM atlas

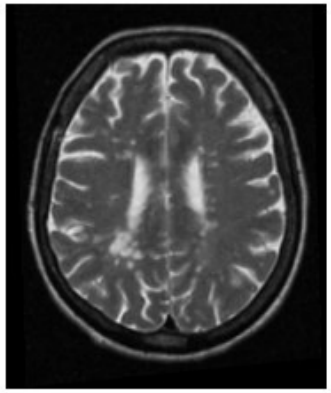
- **Multivariate intensity patterns deviating significantly (χ^2) from the 3 classes models are potential lesion voxels**

Grey Matter

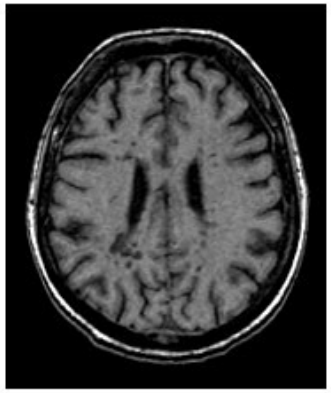
White Matter

CSF

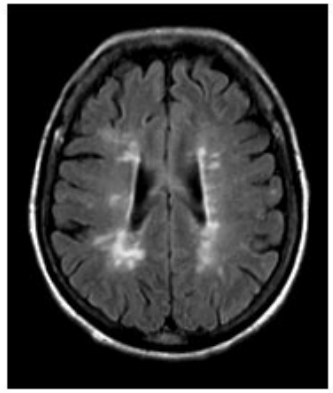
Lesions



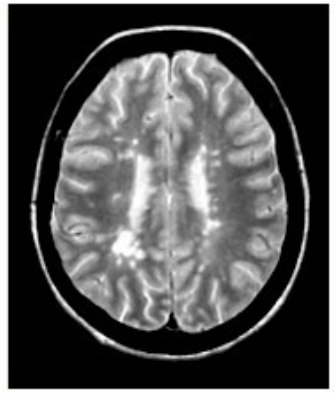
MRI T2



MRI T1



MRI T2 FLAIR



MRI PD