

# Virtual Imaging Platform

Enabling distributed computing for medical image simulation

Tristan Glatard, Rafael Ferreira da Silva, Sorina Camarasu-Pop  
 CREATIS ; CNRS UMR5220 ; Inserm U1044 ; Université de Lyon

## Context

### Goals

- Provide online access to medical image simulators
- Annotate data to facilitate retrieval and usage
- Support computing and data requirements

### Challenges in biomed VO

- Hardware heterogeneity
- Job failures
- Data transfers (e.g. result merging)

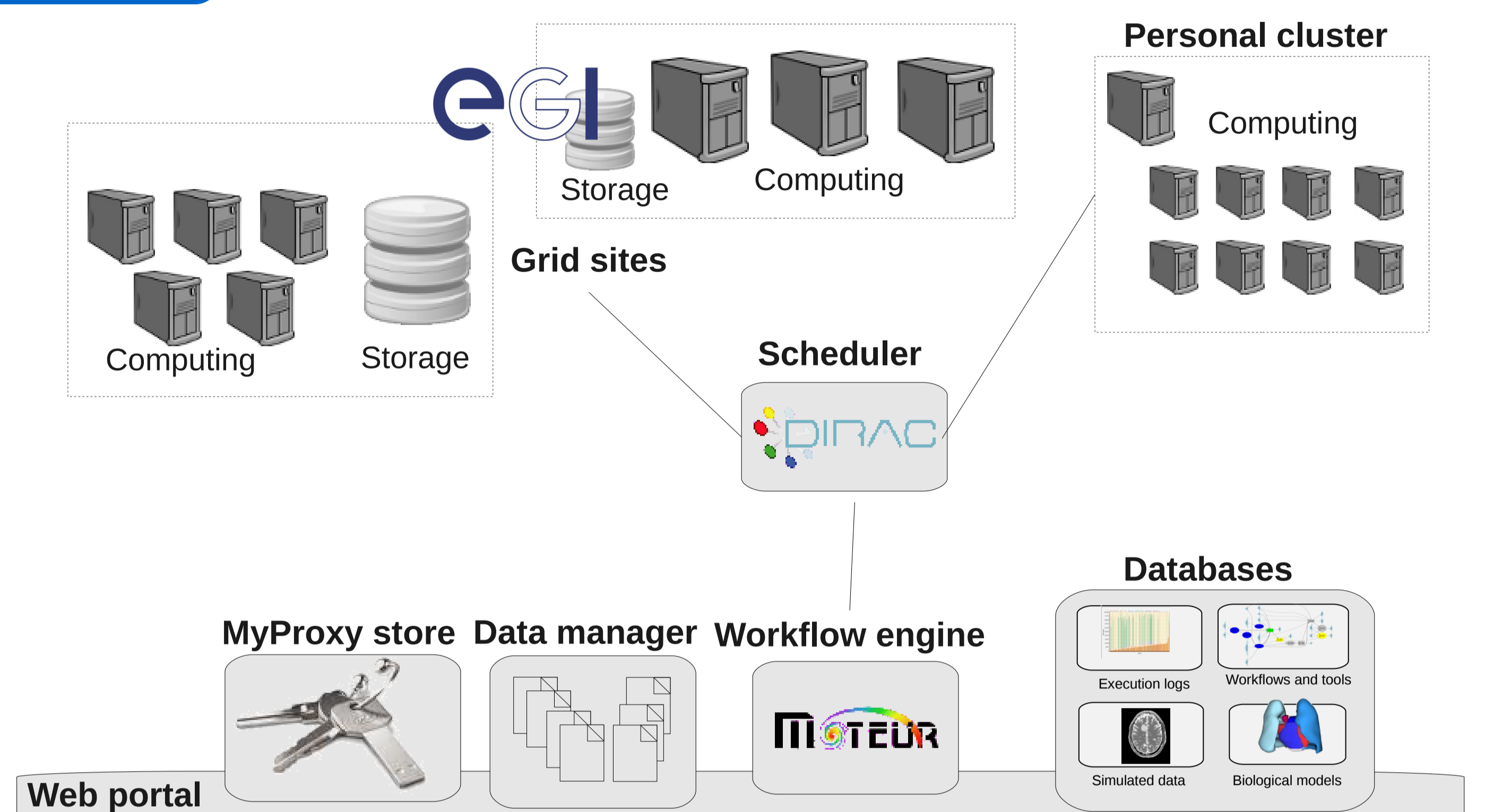
## Platform outline

### Computing

- DIRAC pilot-job system
- Local personal clusters can be used
- Applications are MOTEUR workflows

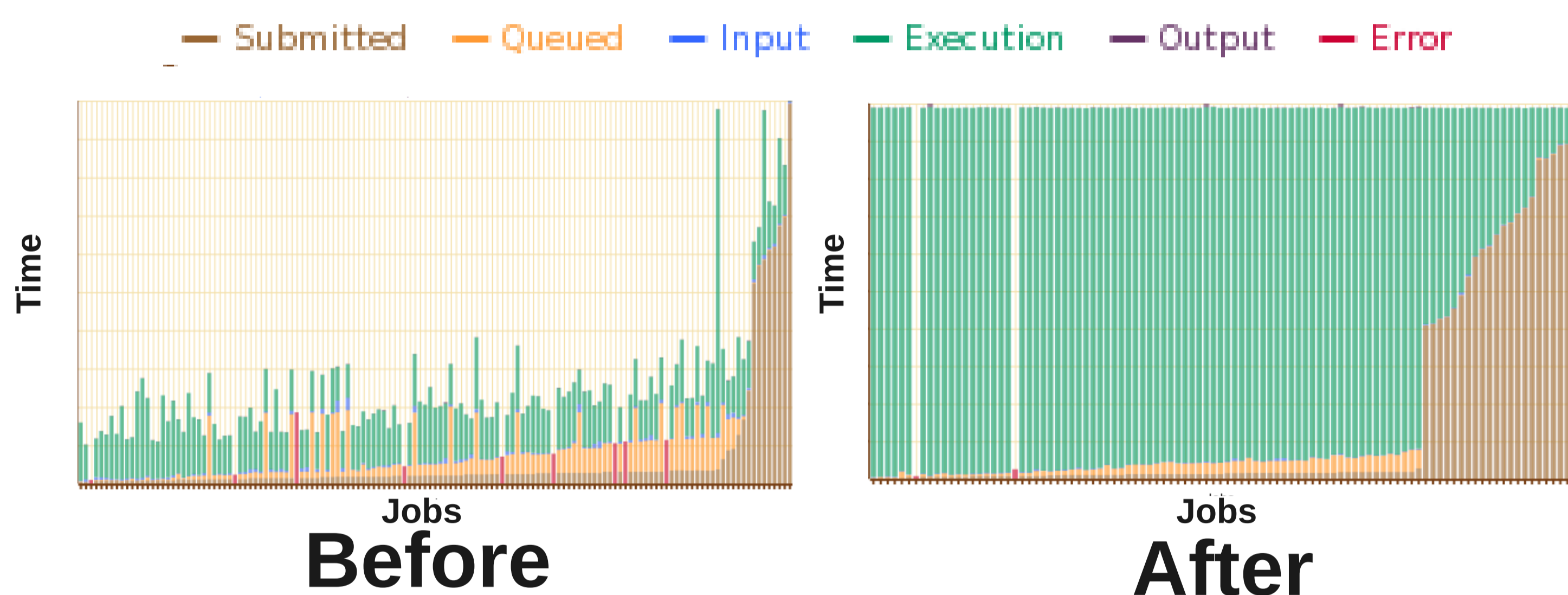
### Data files

- Indexed in the Logical File Catalog
- Replicated on platform's Storage Element
- Cached in portal and worker nodes
- Biological models are semantically indexed



## Optimization

Dynamic load-balancing of Monte-Carlo tasks:



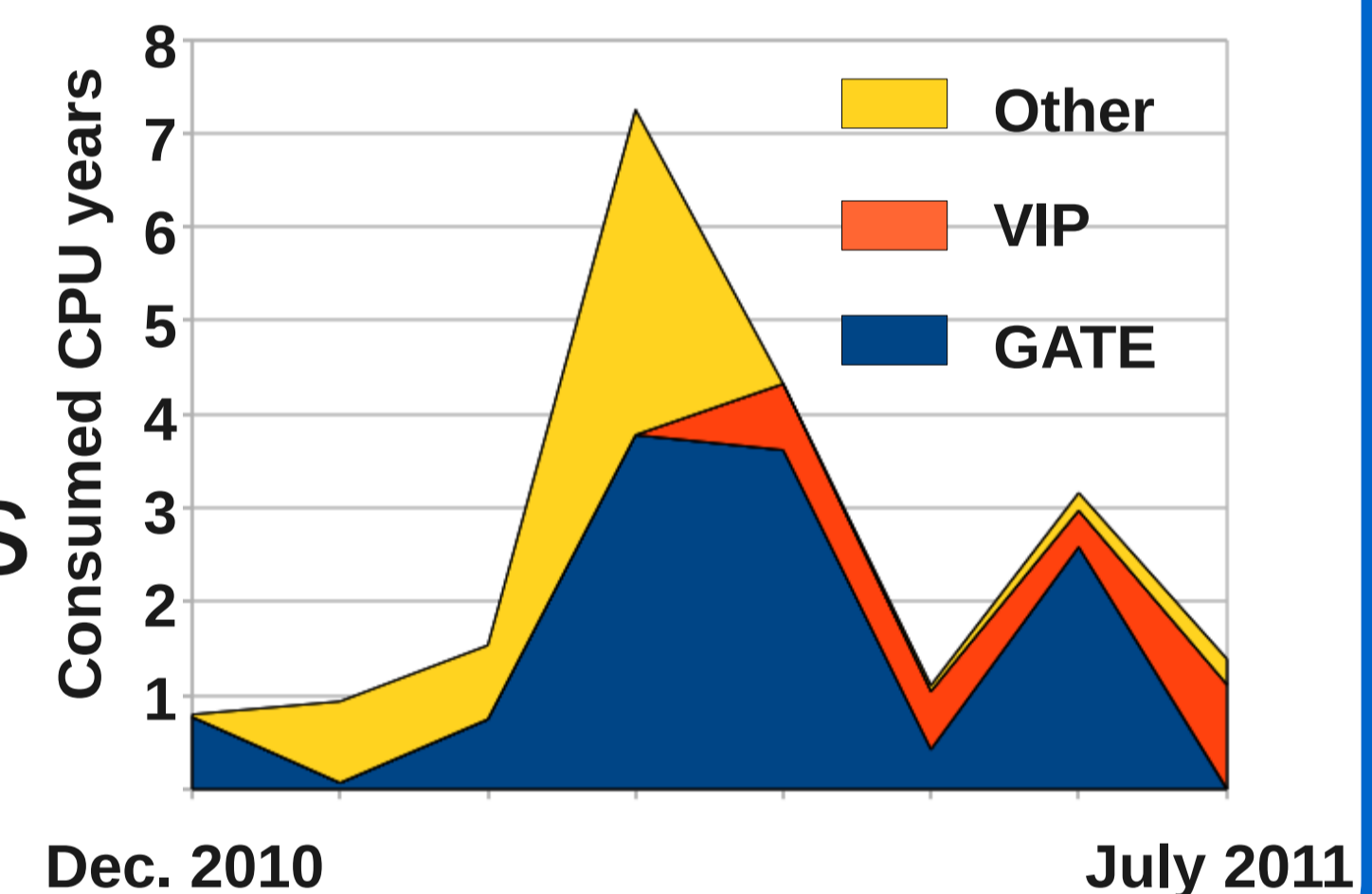
## Usage report

### Achievements

- 9 regular users, 8 applications
- > 1 CPU year / month

### Main issues

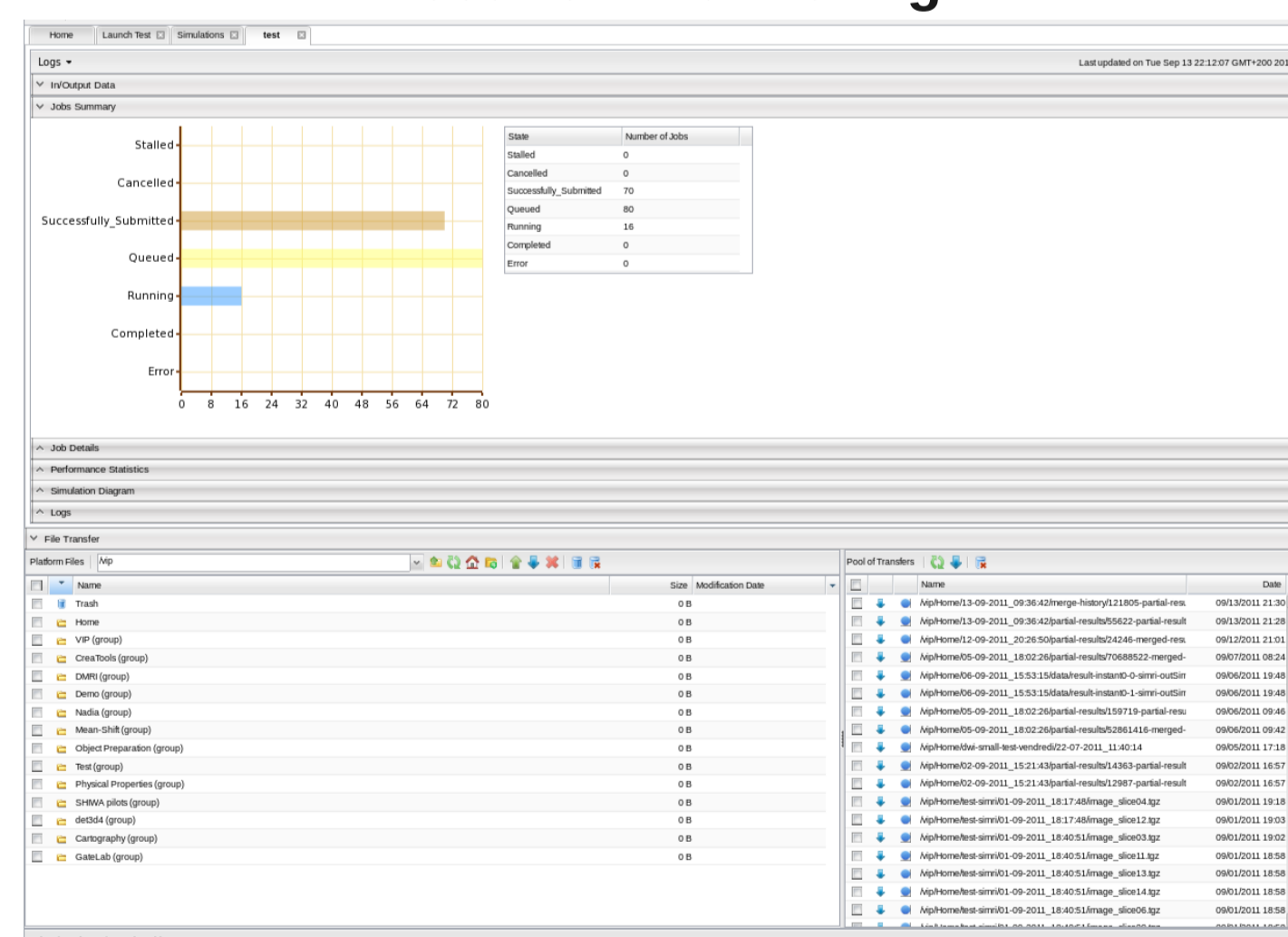
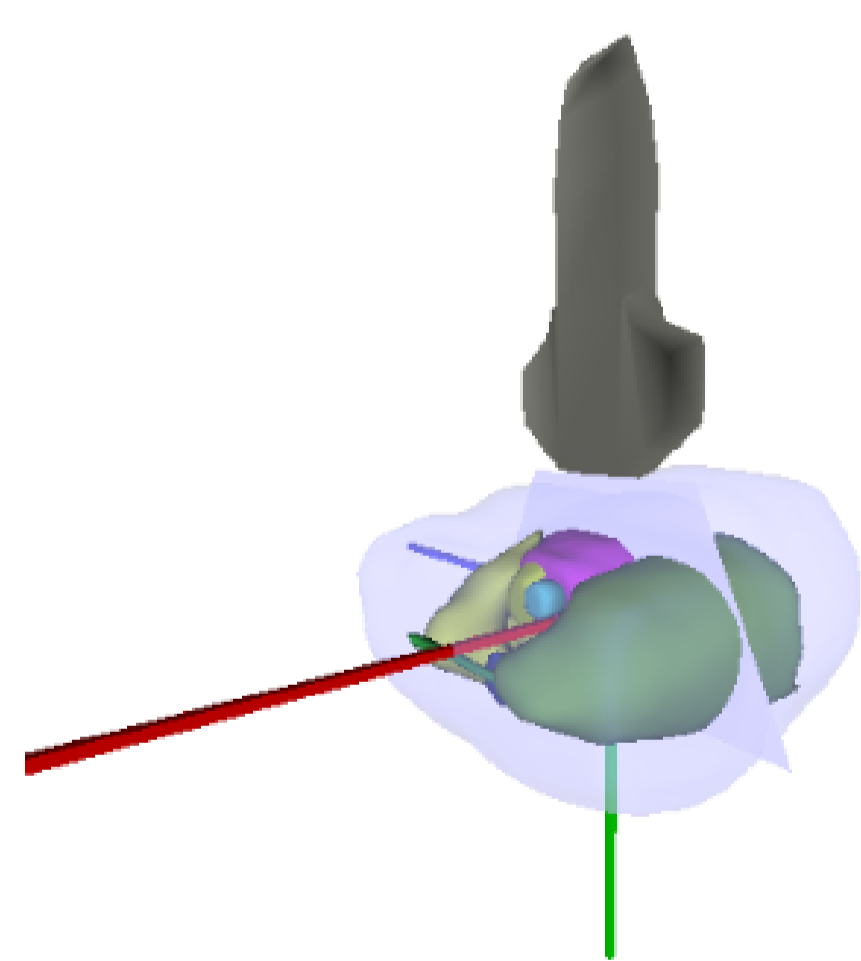
- Scalability, robustness
- Administration
- X509 authentication



## Snapshots

Simulation definition

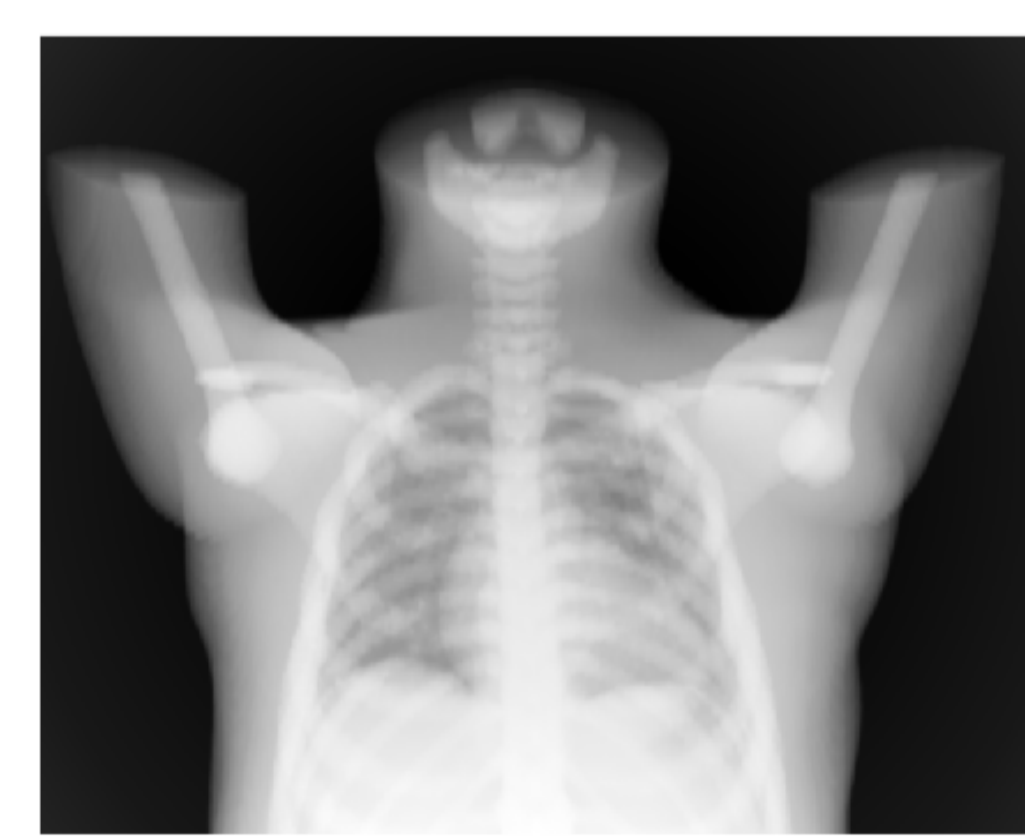
Execution monitoring



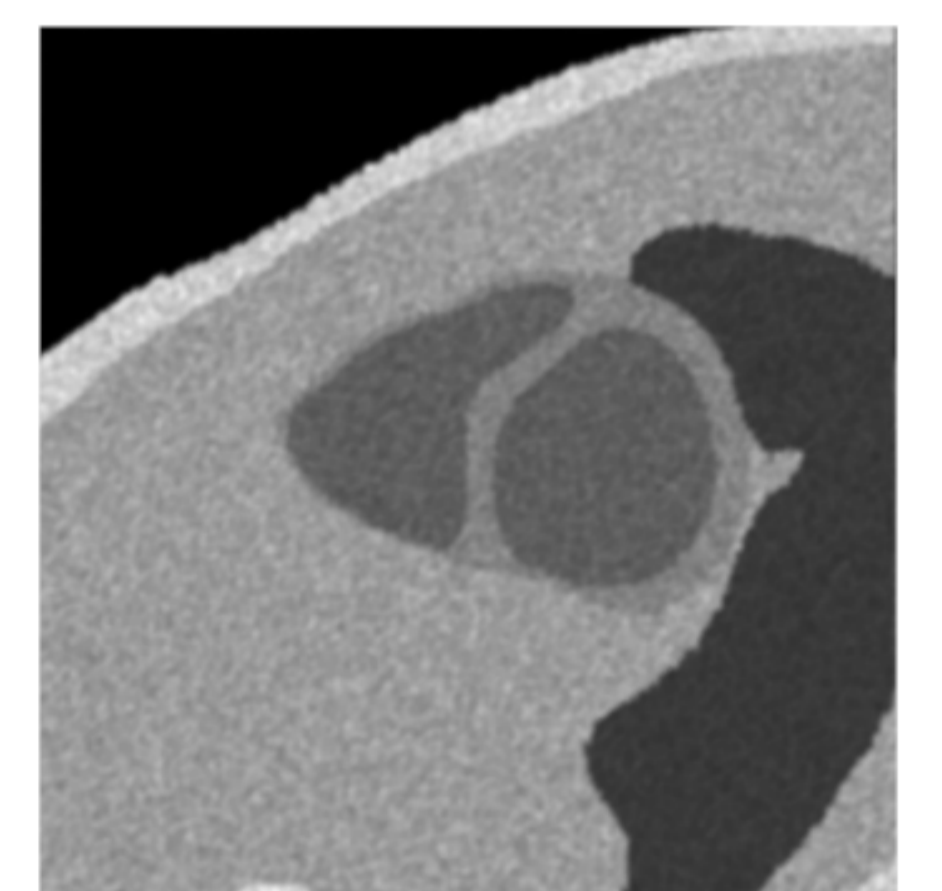
Simulated ultrasound image



Simulated X-Ray image



Simulated MRI



## On-going work

### Grid-related

- Checkpoint / restart workflows
- Improved merging of job results
- Assisted administration

### Semantic annotations

- Simulated data
- Simulation tools
- Integration in workflow designer

### Credits

**Platform development:** Sorina Camarasu-Pop, Rafael Ferreira da Silva, Tristan Glatard, Baptiste Grenier, David Manset, Jérôme Revillard  
**Semantic repositories:** Germain Forestier, Alban Gaignard, Bernard Gibaud, Johan Montagnat, Javier Rojas Balderrama  
**Simulators and applications:** Christian Barillot, Hugues Benoit-Cattin, Frédéric Cervenansky, Patrick Clarysse, Denis Friboulet, Patrick Hugonnard, Carole Lartizien, Hervé Liebgott, Adrien Marion, Joachim Tabary



contact: vip@creatis.insa-lyon.fr