# Porting ThIS on the EGEE Grid

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## What is ThIS?

ThIS is a **Th**erapeutic **I**rradiation **S**imulator dedicated to the Monte-Carlo simulation of the irradiation of living tissues with photons, protons or light ion beams for cancer therapy. It simulates the transport of particles through the patient tissues and computes the dose distribution within the patient's body from a given set of irradiation parameters (figure 1). ThIS is based on the Geant4 toolkit and is now part of the fGATE project. More information on ThIS can be found at:
https://www.creatis.insa-lyon.fr/rio/ThIS

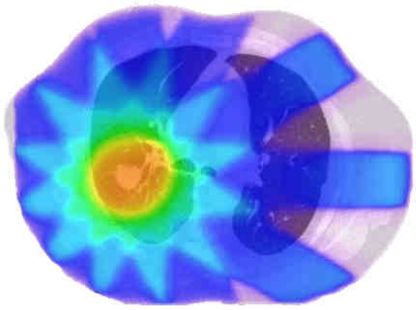

Figure 1 –ThIS Simulation

## Porting Methods

The process of porting ThIS on the EGEE Grid can be split into 3 different phases

**1. Basic adaptability**
*Aim:* successful execution
*Problem:* WN heterogeneity and shared libraries
*Method:* configuration scripts and static building/linking

**2. Intermediate adaptability**
*Aim:* application parallelization
*Method:* Monte Carlo simulation splitting into independent sub-jobs

**3. Advanced adaptability**
*Aim:* submission automation, computation time and load distribution optimization
*Method*: advanced tools for parallel job submission (figure 2): Ganga (http://cern.ch/ganga) & DIANE (http://cern.ch/diane)

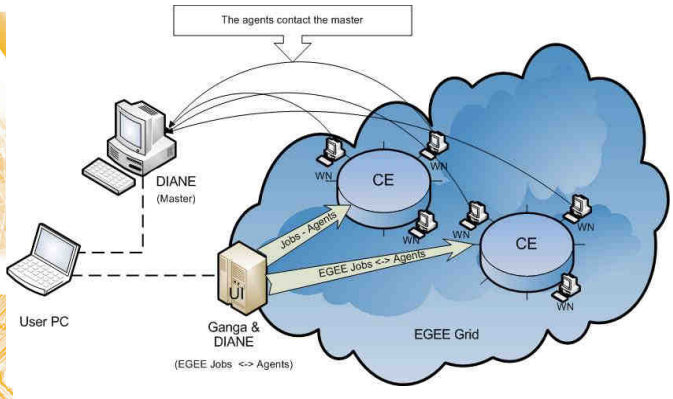


Figure 2 – Advanced ThIS Job Submission Architecture

## Results

Results obtained for 20000000 (20M) simulated particles divided among 100 parallel jobs.

| Architecture | Computation Time |
|---|---|
| PC Intel Duo Core 2.4 GHz | 8h30 |
| Classical submission (gLite) approach | up to 24h |
| Advanced submission approach | 1h45 |

| | Failed Jobs | | Successful Jobs | Final Result | Remarks |
|---|---|---|---|---|---|
| **Classical submission (gLite) approach** | 12% (aborted) | 10% (execution errors) | 78% | 78% | |
| **Advanced submission approach** | 15% | | 85% | 100% | Final result reached while 20% of the jobs still 'Scheduled' |

## Perspectives

Further improvement of the advanced adaptability aiming at a more flexible parameterization and at a higher degree of automation.
Development of a user-friendly interface through a web-portal similar to the one in figure 3.

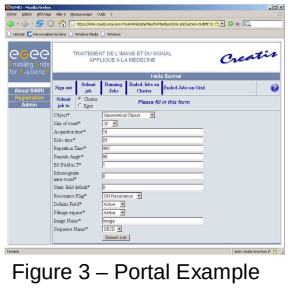

Figure 3 – Portal Example