

NA4 – BIOMED VO

Enabling Grids for E-sciencE

# Creatis

## Porting ThIS on the EGEE Grid

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#### What is ThIS?

ThIS is a Therapeutic Irradiation Simulator 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)



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Figure 2 – Advanced ThIS Job Submission Architecture

Architecture



PC Intel Duo Core 2.4 GHz	8h30					Al an a
Classical submission (gLite) approach	up to 24h					<b>e</b> alane
Advanced submission approach	1h45					
	Fai	led Jo	bs	Successful Jobs	Final Result	Remarks
Classical submission (gLite) approach	12% (aborted)	(exe	10% ecution errors)	78%	78%	
Advanced submission approach		15%		85%	100%	Final result reached while 20% of the jobs still 'Scheduled'



### **Perspectives**

**Computation Time** 

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.

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#### Figure 3 - Portal Example

Results

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