

CENTRALIZED DEPLOYMENT OF THE FRENCH BIOINFORMATICS GRID RENABI



Enabling Grids for E-science

ELOTO C. (CNRS IBCP¹), MICHON A. (CNRS IBCP¹), ROULT A. (CNRS INRIA IRISA²), COLLIN O. (CNRS INRIA IRISA²), CARON C. (CNRS SBR³), BLANCHET C. (CNRS IBCP¹)

contact : GRISBI@IBCP.FR

- (1) IBCP - UMR 5086 CNRS Université de Lyon - 7, passage du Vercors 69367 Lyon cedex 07, FRANCE
- (2) Equipe Symbiose - Plate-forme GenOuest IRISA-INRIA - Campus de Beaulieu 35042 Rennes cedex, FRANCE
- (3) Station Biologique / CNRS-UPMC - Service Informatique et Génomique - Place Georges Teissier BP 74 29682 Roscoff cedex, FRANCE

RENABI

ReNaBi (Réseau National des plates-formes Bioinformatiques) is the French Bioinformatics platforms network built upon the different bioinformatics platforms located in different cities and regions of France. These platforms provide many resources for the bioinformatics and life science communities. Each one producing certified tools, databases and documentation. ReNaBi supports the structuration of Bioinformatics in France through its activities.

[@www.renabi.fr](http://www.renabi.fr)

GRISBI

The GRISBI Platform (Grid Support for Bioinformatics) is a joined initiative between six French Bioinformatics platforms of the ReNaBi network: PRABI Lyon, GenOuest Rennes and Roscoff, CBiB Bordeaux, BIPS Strasbourg, CIB Lille, MIGALE Jouy-en-Josas, to set up a grid infrastructure devoted to serve the bioinformatics community at the national level.

[@www.grisbio.fr](http://www.grisbio.fr)

The first step of the GRISBI project was to find a model of grid middleware deployment designed for the bioinformaticians operating the ReNaBi platforms and who have most of the time no experience in grid middleware installation and management.

We present here the GRISBI model mainly based on Quattor tools.

QUATTOR

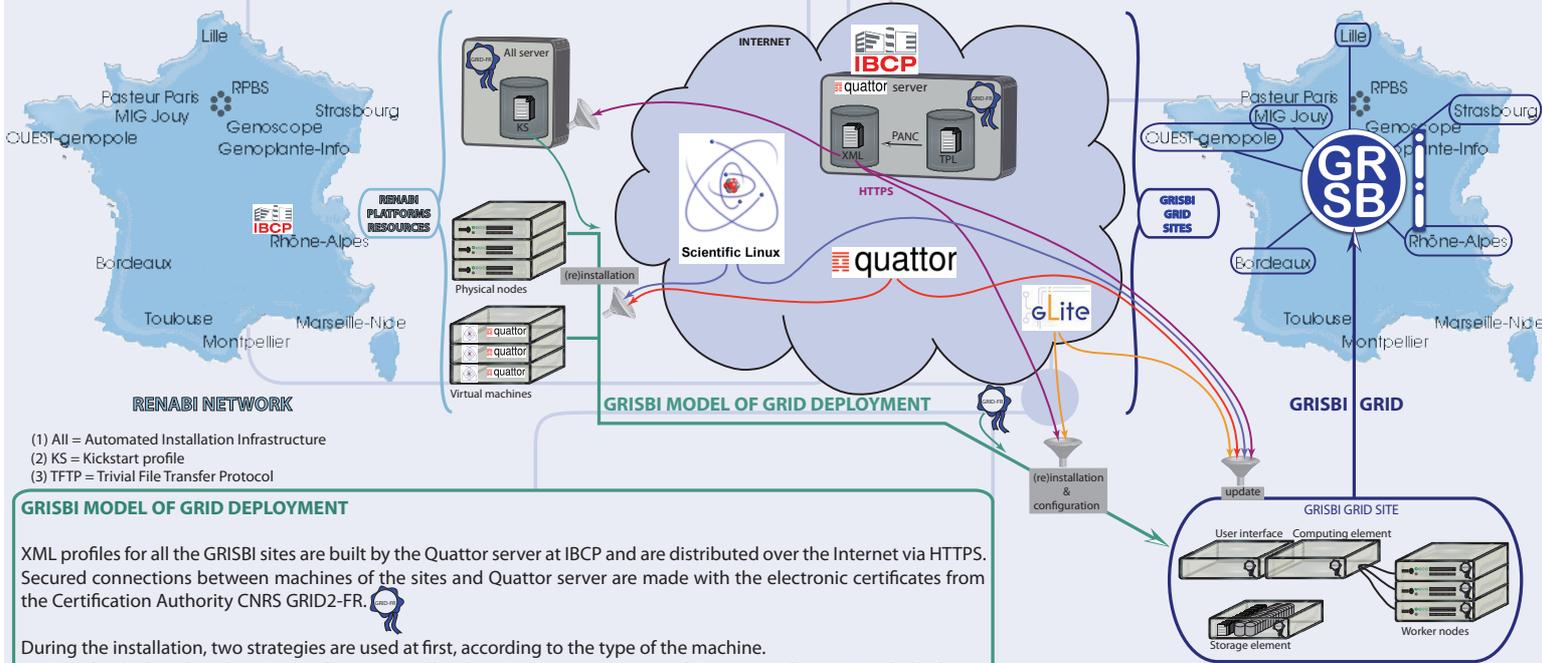
Quattor is an open-source software, which provides administration tools for automated installation, configuration and management of machines. The architecture of the system is client/server based. The clients are the machines to administrate. And the server runs a database containing the templates used to write XML profiles.

The **TEMPLATES (TPL)** describe hardware, gLite middleware, services, parameters of nodes and sites in a high level description language (PAN). A set of generic templates, written by the Quattor Working Group (QWG templates), provides online configuration for every type of gLite nodes.

On the server, there is one **XML profile** per machine with its entire description (OS, softwares, gLite middleware, services). This profile is built by the PANC compiler from the templates. And it provides the informations required by the Quattor client components, deployed on the target node, to install, configure and update this node.

Benefits of Quattor tools

- * With QWG templates, it isn't necessary to be an expert in gLite or cluster deployment to install a grid site.
- * Homogeneity and reproductibility of the nodes: in the templates, the common parameters between the nodes are set only once.
- * Quick installation and reinstallation of identical machines.



- (1) All = Automated Installation Infrastructure
- (2) KS = Kickstart profile
- (3) TFTP = Trivial File Transfer Protocol

GRISBI MODEL OF GRID DEPLOYMENT

XML profiles for all the GRISBI sites are built by the Quattor server at IBCP and are distributed over the Internet via HTTPS. Secured connections between machines of the sites and Quattor server are made with the electronic certificates from the Certification Authority CNRS GRID2-FR.

During the installation, two strategies are used at first, according to the type of the machine.

⇒ **For physical nodes:** the XML profiles are read by the All¹ component (part of Quattor tools) to write the kickstart profiles (KS²) (one per machine). A node boots using its network interface (PXE boot), downloads the network bootstrap program stored on a TFTP³ server and executes it. This program indicates which boot kernel should be used to install the right operating system and the URL of the KS profile. The role of this KS profile is to provide the values required during the installation and to deploy the Quattor client components.

⇒ **For virtual machines:** a template of a virtual machine with a basic Scientific Linux distribution and the Quattor client components has been created. It is available for the authorized administrators of GRISBI sites. The virtual machine's settings (number of CPU/disks, size of the RAM) must be modified depending on the type of node that will be deployed.

For the second step of the installation, the processus is the same for virtual and physical nodes. A grid certificate is manually copied on the node so it can download its XML profile stored on the IBCP server. This profile is read by Quattor client components to finish the installation (gLite...) and configure the machine as a grid node (services, scripts, accounts...). Quattor components will update the machine according to the modifications of XML profiles made at IBCP.

Benefits of GRISBI model

- * Operations are done by one administrator.
- * Could move to a model with several grid administrators.

GOALS OF GRISBI PARTNERS

- * Share their resources (computational power, storage, applications and biological data) with the French bioinformatics community through the virtual organization **VO.RENABI.FR**.
- * Deploy bioinformatics applications and data:
 - ⇒ gridify bioinformatics algorithms and softwares and install them on the worker nodes,
 - ⇒ make biological databanks available on the storage elements.
- * Site management:
 - ⇒ disseminate the grid technology through teaching sessions,
 - ⇒ train one gLite and Quattor expert per platform.



The EGEE project is building a Grid infrastructure for the scientific community. Grids are networks of computers spread across many sites but able to act together to provide a range of large scale facilities, from incredible processing power and mass storage to a platform for international collaboration.



www.eu-egee.org



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