

Grid Middleware and GROWL

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- Software Engineer in Grid Technology Group
- Limited knowledge of GIS (for me, only Geographic[al] Information Systems)
- Keen Orienteer, some cartographic work
- map

- Grid and Grid Middleware?
- The GROWL Project
- eCPP Project

- Analogous to the National Grid, it is a network of pooled resources that provide "power" on a larger scale than would be possible using a single resource.
- Resources can be for computational or data/archival, or even an instrument data source such as a telescope, microscope or weather sensor.

"We have encountered serious middleware-related problems which are hindering scientific progress with the Grid:

- The existing toolkits have an excessively heavy set of software and administrative requirements, ... ;
- Existing toolkits are painful and difficult to install ...;
- Existing standards bodies ... are not engaging sufficiently with the applications community, and run a substantial risk of producing and implementing Grid architectures which are irrelevant to the requirements of application scientists."

Chin and Coveney, RealityGrid, 2004

Source file downloads for Globus

GT 2.4.3

6,499,405 [globus-resource-management-client-2.4.3-src_bundle.tar.gz](#)
7,992,912 [globus-information-services-client-2.4.3-src_bundle.tar.gz](#)
5,231,337 [globus-data-management-client-2.4.3-src_bundle.tar.gz](#)

GT 3.2

64,004,681 [gt3.2.1-all-source-installer.tar.gz](#)

GT 4.0.1

118,288,751 [gt4.0.1-all-source-installer.tar.gz](#)

- Typically need to be **root** to install
- Software must be downloaded from various locations (unless software stacks such as OMII / VDT is used)
- There are many choices for type of installation (too many options?)
- Firewalls can get in the way when setting things up

Collaborative project (JISC VRE programme) between CCLRC Daresbury Laboratory and the Universities of Cambridge and Lancaster.

Project Objectives: to produce a lightweight client-side Grid connection toolkit.

- Transparent client-side handling of Grid-related issues e.g security, file transfer etc.
- Modules, libraries and wrappers that interface with existing client software tools
- Extensibility via a simple API with common language mappings (C++, C and Fortran).
- A persistent multi-client server linked to existing grid components (primarily the Globus toolkit) providing access to HPC resources, session management, scheduling, authentication etc.

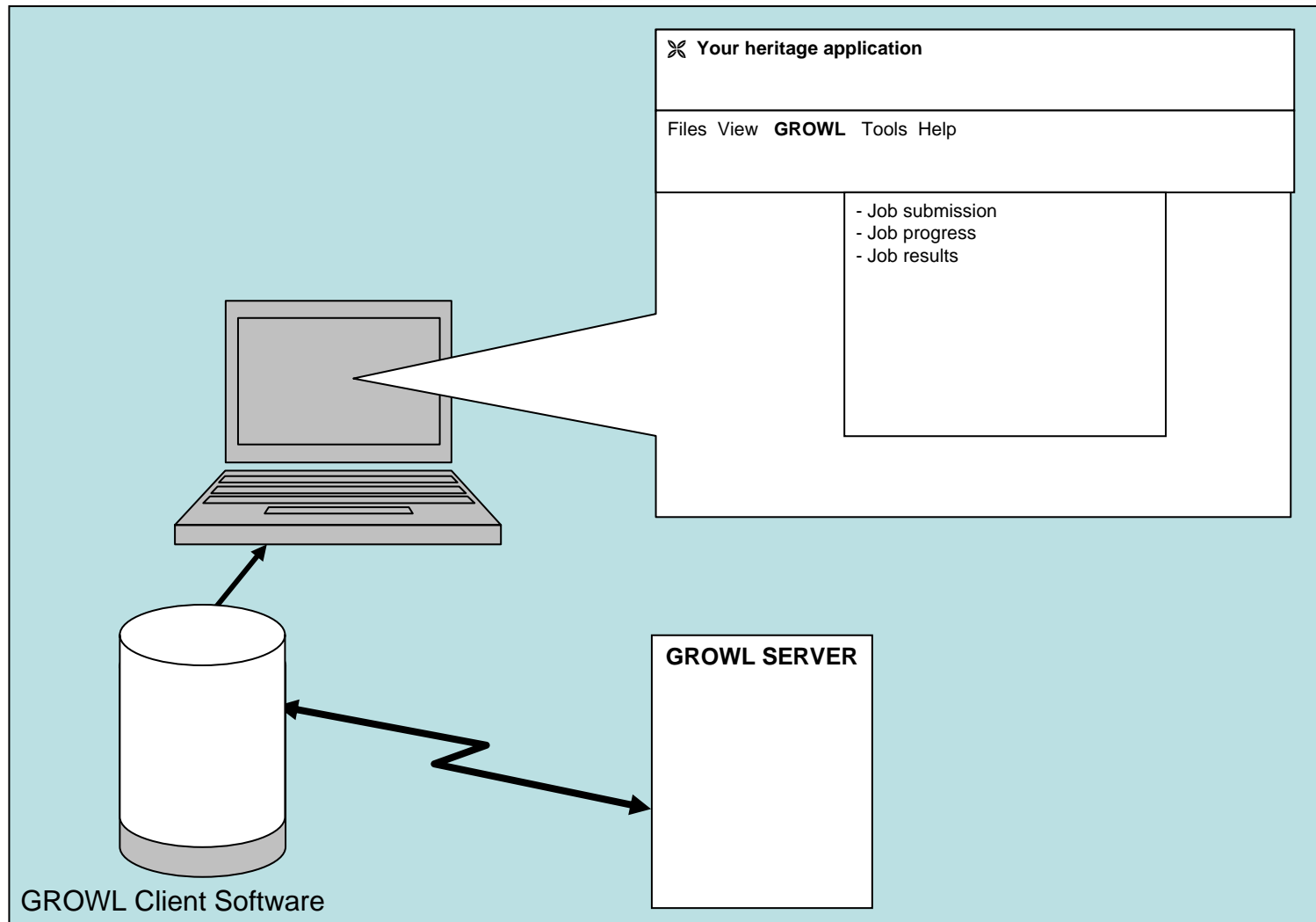
But what does that mean?

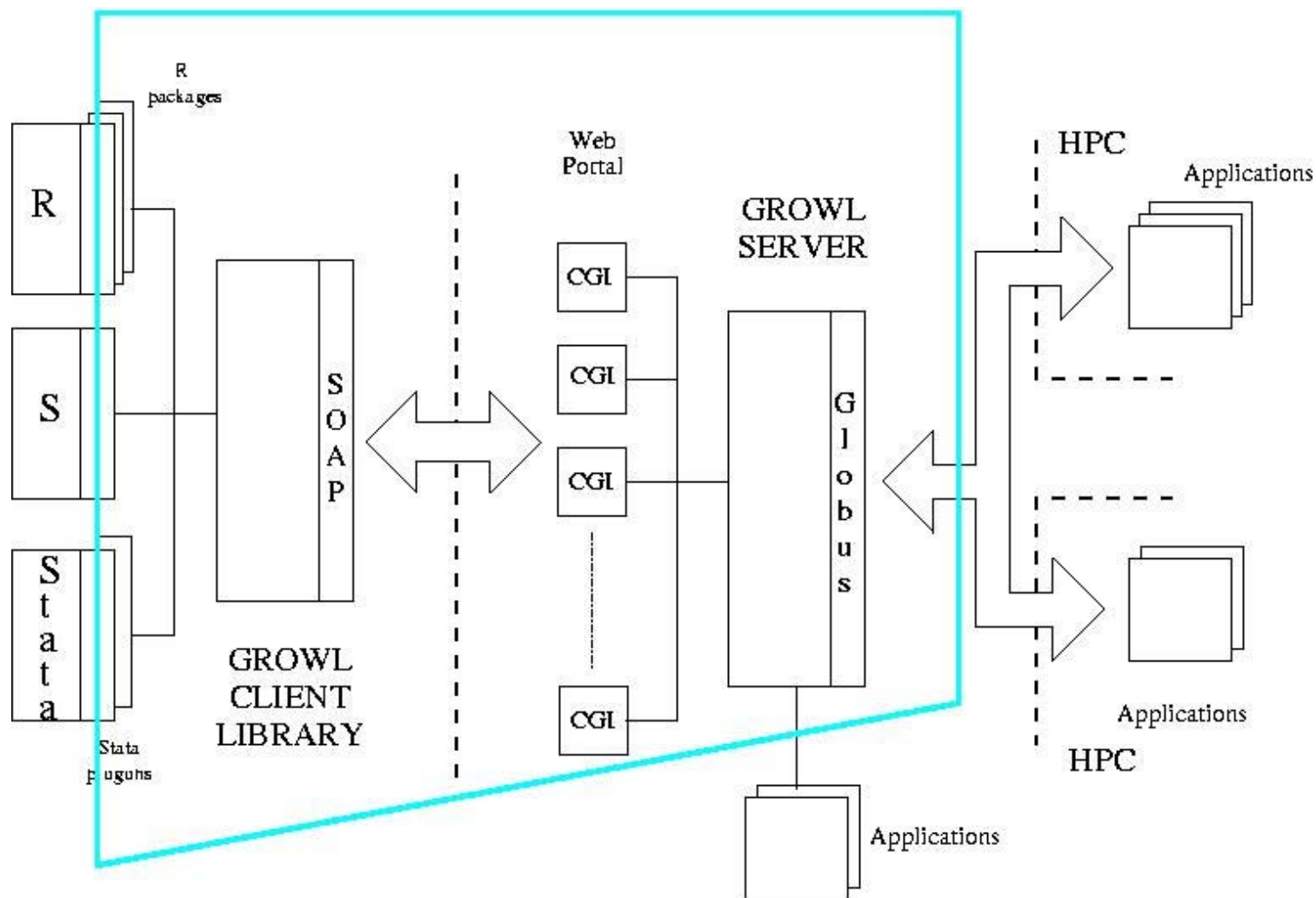
- Basically, GROWL will only download and build sufficient software to provide a client-side interface to Grid software.

It will not build you a grid resource!

- GROWL will provide simple, generic interfaces to Grid middleware - remember the 80/20 rule!
- If you can have C-linkable libraries in your favourite GIS package, you should be able to link to GROWL (e.g. Matlab, Stata, R).

What the User sees





- Only builds the GROWL modules you request
- Downloads and installs any dependent software for you: e.g. Globus, SRB client, gSOAP, MyProxy
- Currently Linux only, but aiming to support Windows XP and other Unix

What is being provided?

- Job submission
- Authentication / Session Management
- File transfer
- Wrappers to SRB
- Interface to Condor Web Services "Birdbath"
- Wrappers for R, Sabre-R, Stata, Fortran, Matlab
- `mk_cert` for certificate installation
- `grid-login`, `grid-logout`, `grid-info` for use of proxy certificates

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Bioinformatics

Analysis of microarray expression data. (R and Matlab are popular)

Computational Chemistry

Collaboration with CCP1 project to incorporate GROWL C library calls with legacy code, e.g. DLV, GAMESS-UK

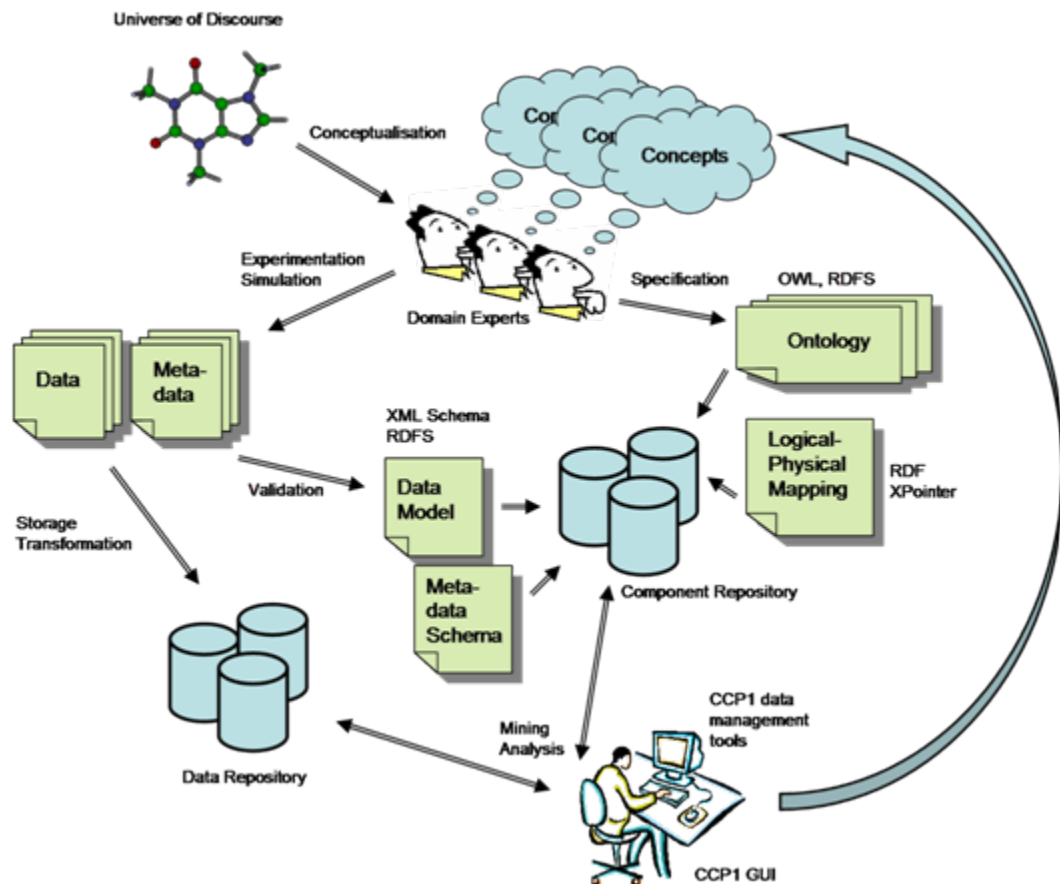
Social Science

Grid-enable the SABRE statistical modelling package (based on R) used for work/life history data analysis.

GIS ?

We are currently looking for further User Requirements

<http://www.growl.org.uk/>



Data virtualisation for
Computational Chemistry

Automated exchange of
chemical information in
computational workflows

Common tools for
knowledge acquisition

- There is a lot of Grid Middleware that does a good job of holding the Grid together but it must be configured first.
- Doing simple things on the Grid should be simple
- Growl aims to provide that simple interface:
"My First Grid"
- There may also be some intersection of interests between GML community and eCCP project.