Gatlet - a Grid Portal Framework

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Needs a portal to give grid newbies an easy access to services and resources

Scientists from different fields need portals for easy grid access
Outline

- Architecture
- GridSphere
- GAT
- Gatlet
- Gatlet Resources
- Gatlet Security
- Gatlet Core Portlets
- Gatlet Service API
- Avatar Help System
- Future plans
Architecture of a Gatlet portal
GridSphere
GridSphere

- Portal Framework
- Lightweight
- Easy development and integration of custom portlets
- Integrates User and Role Management
- Is using Hibernate for data persistence
- User interface tag library
- X.509 Certificate Authentication
Grid Application Toolkit (GAT)
Grid Application Toolkit (GAT)

- GAT aims to provide a simple and clear interface to many different grid resources (Globus Toolkit, gLite, Unicore, dCache, GridFTP)
- Different Implementations (C, C++, Java, Python)
- Easy to use API with focus on application developers and scientists
  - Application programmers do only learn a single API, that of GAT, to obtain access to different grid resources
- Modular architecture which is easy to extend with new types of protocols and middlewares
Gatlet
Gatlet

- Gatlet = GAT + Portlet
- Grid Portal Framework and Service Provider
- Supports access to multiple middlewares and protocols (GT4, gLite 3.1, GridFTP, SRM)
- Provides vendor independent data persistence for storing jobs and resources in the portal
- Easy to use Service-API for developing scientific portlets
- Includes core portlets for instant grid access
Gatlet Security
Gatlet Security

- HTTPS
- Portal Authentication via X.509 or Username/Password
- MyProxy
- Single Sign On for grid access
- Grid Proxy Manager (Firefox Plugin)
Grid Proxy Manager

- Select Your Grid User Certificate
- MyProxy Date
- Last accessed: koios.rz.uni-ulm.de,7512,stefan.bozic
- MyProxy Server: koios.rz.uni-ulm.de
- MyProxy Server Port: 7512
- MyProxy Username: stefan.bozic
- MyProxy Password:
- Retype MyProxy Password:
- Proxy Type: Full legacy globus proxy (introduced in GT2)
- Proxy Lifetime [in hours]: 168

- Certificate Local Dir: ~/.gridProxyManager/certificates/
- Chain of Trust URL: http://dist.eugridpma.info/distribution/igtf/current/accredited/
- Update anyways: 

Status Log

1. The Chain of Trust store will be updated before next certificate upload.
2. Please fill in your MyProxy user data and hit the Upload button. Please click on ‘Help’ if you need more instructions.
Portlets

Diagram showing the architecture of GridSphere and Gatlet, including connections to the browser, JVM, sandbox, applets, local disk, trusted CA, GridFTP, Tomcat, GridSphere, Gatlet DB, MyProxy-Server, and the Grid.
Gatlet Core Portlets

- MyProxy
- Script Job Submission (Globus, gLite)
- Job Monitoring / Job Details
- File Browser (SRM, GridFTP)
- Resource Management
- SSHTerm
## File Browser Portlet

![File Browser Portlet Image]

### Directory Structure:

#### GridFTP bwGRiD Esslingen
- **Name**: `.bash`, **Berechtigung**: rwx------, **Größe**: 4096 B, **Datum**: Mar 10 13:05
- **Name**: `.bash_history`, **Berechtigung**: rw--------, **Größe**: 4 B, **Datum**: Mar 10 13:07
- **Name**: `Gatlet_Logo.png`, **Berechtigung**: rwxr--r--, **Größe**: 2657 B, **Datum**: Mar 3 09:48

#### GridFTP bwGRID KIT
- **Name**: `.globus`, **Berechtigung**: rwxr--r--, **Größe**: 4096 B, **Datum**: Dec 22 14:36
- **Name**: `.ssh`, **Berechtigung**: rwxr-xr-x, **Größe**: 4096 B, **Datum**: Aug 12 10:46
- **Name**: `portal`, **Berechtigung**: rwxrwxr-x, **Größe**: 4096 B, **Datum**: Nov 12 08:15
- **Name**: `sandbox`, **Berechtigung**: rwxrwxr-x, **Größe**: 4096 B, **Datum**: Dec 22 14:31
- **Name**: `.bash_logout`, **Berechtigung**: r--r--r--r--, **Größe**: 24 B, **Datum**: Apr 5 00:14
- **Name**: `.bash_profile`, **Berechtigung**: r--r--r--r--, **Größe**: 176 B, **Datum**: Apr 5 00:14
- **Name**: `bashrc`, **Berechtigung**: r--r--r--r--, **Größe**: 124 B, **Datum**: Apr 5 00:14
- **Name**: `.zshrc`, **Berechtigung**: r--r--r--r--, **Größe**: 658 B, **Datum**: Apr 5 21:37
FileBrowser Portlet

easy GSI-SSHTerm

Welcome to the GT-Frontend of the bwGRiD-Cluster of the University of Tübingen

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* General Information:
  * http://www.bw-grid.de/
  * Local Batch System Documentation:
    * http://www.dwz.uni-tuebingen.de/dienstleistungen/computing/batchesystems/hpc-bw.html
  * D-Grid User Support:
    * http://dgs.d-grid.de/
  * E-mail Adam-Team Tübingen:
    * hpcmaster@uni-tuebingen.de

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* PERIODICALLY "an bw-grid" *BEFORE* using the grid. By using the grid, you agree to the terms and conditions found in "man bw-grid".
  * WARNING: This system is monitored to prevent misuse.
  * The home directory is NOT part of any backup.
  * Workspaces are not available right now (in contrast to other sites).
  * Environment variables are in place, see "man bw-grid".
  * Please do NOT calculate anything in foreground on our login nodes. But you can use the real frontend (ssh hpc-bw) to compile your program.

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[Some text and buttons]
Scientific Portlets

- Developed in the bwGRiD portal project
- Chemistry Portlets
  - Gaussian/NWChem
  - Moldyn
  - Amber
- CAE Portlets
  - Fluent
- Medical Portlets
  - SWP
Gaussian/NWChem Portlet
Moldyn Portlet

Particle simulations with Moldyn

Job Name:
Requested walltime for the job:
(Please modify the default value if necessary)
00:00:10
Upload XML file:

List of uploaded files:

Submitted Jobs

Job id: Job name: Job state:

ID Name Resource Scheduler Queue Status Submission time

6 NWChem Job: Demo kiois rz uni-ulm de PBS user DONE_SUCCESS CET 2011-02-16 15:31

1 Remove selected Refresh selected (This can take awhile)
Gatlet Software Stack

- Gatlet Core Portlets
- Scientific Portlets
- Other Grid Application
- Gatlet-GS-API
- GridSphere
- Gatlet-Core API
- JavaGAT
- JPA
Gatlet Service API

FileService
+createFile()
+createFileWithCheckAndTimeout()
+createFileInputStream()
+createFileOutputStream()
+getHomeDirectory()
+getHomeDirectoryTimeout()

JobServiceImpl
+getAllUserJobs()
+saveJob()
+getJobById()
+refreshJob()
+refreshJobList()
+stopJob()
+submitJob()
+submitScriptJob()

ResourceService
+getGlobusResources()
+getVoResources()
+getResourcesListForUser()
+saveResource()
+deleteResource()
+getResourceStatus()

MonitoringAndDiscoverService
+getWmsResources()
+getQueues()
+getUnicore6Sites()
Avatar Help System

- **Features**
  - Explain input elements on a page along with input verification
  - Step-by-step guidance, through multiple portlets on multiple pages
- **JavaScript based**
  - no plugins, no additional software needed
  - compatible to a broad range of browsers
- **Advantages**
  - Instantly available and help offered along with actual content
  - Worked example effect
  - Inherently handles changes to portal layout
  - Minimal effort for portlet developers and administrators to integrate
Avatar Help System

Factorize Number Portlet Example

Step 1: Please fill in the job name and the numbers.

Job Name:

Numbers:

To upload numbers from a local file, please click on [Browse] button and select a local file. Finally click on [Upload].

Gatlet - Job Monitoring Portlet

Submitted Jobs

Job id: Job name: Job state: 

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Resource</th>
<th>Scheduler</th>
<th>Queue</th>
<th>Status</th>
<th>Submission time</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>NWChem Job: Demo koi0.rs.uni-ulm.de PBS</td>
<td>PBS</td>
<td></td>
<td></td>
<td></td>
<td>2011-02-16 16:31</td>
</tr>
</tbody>
</table>

Remove selected  Refresh selected  (This can take awhile)
Future Plans

- Integration of Globus 5
- Integration of Unicore 6
- Migration from GridSphere to LifeRay
- Resource importer for the GOC-DB
- Workflow support
- Development of additional portlets for scientific applications
Links

- http://www.gatlet.de
- http://www.gridsphere.org

- http://www.bw-grid.de
- http://www.ngi-de.eu

- http://www.kit.edu
- http://www.uni-ulm.de
Thank you!