How to build Scientific Gateways with Vine Toolkit and Liferay/GridSphere framework

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Agenda

- Vine Toolkit introduction
- Vine Toolkit – features
- Web portal with Vine Toolkit
- Bundled components
- OGF Standards (JSDL, BES)
- Vine vs SAGA
- Examples of usage: wow2green, Flowify, kepler editor
- Next steps
Vine Toolkit introduction

- A modular and extensible Java/Flex based framework
- Driven from Grid Portlets for GridSphere
- Started before SAGA standard appeared
- Developed within EU funded projects: OMII-Europe, BEinGRID, HPC-Europa2
- Currently is being applied to the Polish NGI portal during the PL-Grid - Polish infrastructural project
Vine Toolkit - features

• Integration with **different portal frameworks**, including well known web products like **Gridsphere, Liferay**
• **Ant based** installer; automatic, simple installation integrated with svn
• Installation support for **Tomcat 5/5.5**
• advanced **BlazeDs data services** improve the client-server communication to develop highly interactive and dynamic web applications
Vine Toolkit - features

- **Adobe Flex/Flash** technology allows creating advanced and sophisticated web interfaces similar to many stand-alone GUIs.
- Other web GUI technologies could be supported (i.e. HTML, JavaScript with Ajax support).
- Uniform common API exposed to the end user which abstracts various middleware implementations.
- Generic resource based model - any services and data sources can be integrated with web applications using high-level APIs.
Web portal with Vine Toolkit

**GUI (layout + portlets)**

- Req/Res
- BlazeDs
- Server: Apache Tomcat
- Portal: Liferay, Gridsphere etc.
  - Users, Authentication, Authorization, Layout management, CMS
- Vine Toolkit
  - Business logic, Integration with portal framework, Extensible API

**GUI (layout + portlets)**

- Flash (Flex), HTML, CSS, JSP
- BlazeDs
- Plugins for different low-level, external services:
  - advanced database sources,
  - data management services,
  - web services,
  - HPC services

**API**
Bundled components

- User / Roles / Application managers - administrative tools
- Login / Registration components plugin based with a support for i.e. Active Directory, MyProxy etc.
- Resource manager – configuration tool for the domain registry
- File browser component (support for the internal Portal File System and various file system protocols)
Bundled components

- Job manager (submission, monitoring)
  generic component (based on JSDL)
- Credential manager (including MyProxy support)
- Resource browser – information services client for MDS in GT4
- Kepler workflow editor
- Set of example components demonstrating Vine's UI features
OGF standards

• **JSDL v1.0 support**
  – Application extensions:
    • **POSIXApplication** (default JSDL extension)
    • **HPCProfileApplication** (used with BES services)
    • **SPMDApplication** (translated with XSLT to define mpi jobs in GT4)

• **BES v1.0 (Basic Execution Service)**
  – developed during OMII-Europe project and reimplemented later to support full HPCProfileApplication JSDL extension
  – tested with many BES compliant services like Unicore BES, CREAM-BES Computing Element, GT4 BES service, Chinese CROWN BES metascheduler service

  • Vine Plugins use XSLT translation if JSDL is not supported (Glite WMS, Globus GT4, proprietary CE resource)
Vine vs SAGA

Both:
- High-level abstraction for different distributed systems
- Shields details of lower level middle-ware and system issues

SAGA:
- Driven from JavaGAT experience
- SAGA is an API that provides the basic functionality required to build distributed applications, tools and frameworks (main target here: scientific standalone applications)

Vine Toolkit:
- Main target – web applications (could be a portlet, servlet, web service backend)
- Grid is one of core components – so wider than SAGA API
- Many more around: flex, blazeds, integration layer with portal frameworks
- Embedded in servlet container – currently Tomcat 5/5.5
- Standalone mode possible but not true competitor in this area for SAGA

Language support:
- Vine (Java 1.5 and newer)
- SAGA (C, C++, Python, Java, other...)
Vine vs SAGA

Common points:
- Task model (Vine Job extends Task model)
- Session, URL, Context, Attributes
- Job Management, Data Management (including data streams in case of Vine)

Common in some part:
- Logical File Management (Vine currently does not support replicas)
- Name Spaces (part of the API is included in the Vine data management)
- Monitoring - no metrics available currently – only task status, description, exception handling
- Permissions partly covered by the Role Manager API

Vine does not support currently:
- RPC, I/O Buffer
- Service Directory - no service discovery, currently provides static configuration of resources in a XML file
<table>
<thead>
<tr>
<th>Middleware</th>
<th>Vinetoolkit</th>
<th>Saga – Java adaptors</th>
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<tbody>
<tr>
<td>gLite 3 - Cream</td>
<td>Yes</td>
<td>Yes - JSAGA</td>
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<tr>
<td>gLite 3 - WMS</td>
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<td>gLite 3 - JDL</td>
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<td>under development - JSAGA</td>
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<td>Yes (4.0.x, 4.2.1)</td>
<td>Yes (up to 4.2) - JSAGA/JavaGAT</td>
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<td>JSDL</td>
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<td>Storage Resource Broker</td>
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<td>(S)FTP, SSH, HTTP(S), ZIP</td>
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<td>iRODS</td>
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<td>NAREGI (Super Scheduler)</td>
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<td><strong>QosCosGrid</strong></td>
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<td>Nagios Monitoring Service</td>
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Flowify application
Kepler workflow editor
Next steps

- PL-Grid project
  - Liferay portal – integrated Vine Toolkit
    • Liferay Collaboration Suite integration thread pending…
  - web applications:
    • grid related
    • scientific application oriented (QocCosGrid components used below)
    • web based visualization thread pending…
- HPC-Europa2 project
  - data management web application
- SAGA
  - not decided yet, existing Java version could be incorporated as an extension to „webify” standalone SAGA based scientific applications
- Follow the standards if possible (like OGF standards)
Thank you!

Any questions, comments or remarks are very welcome.

contact: dejw@man.poznan.pl

Vine Toolikt: http://vinetoolkit.org/
Vine users mailing list: vine-users@gforge.man.poznan.pl


QosCosGrid: http://larix.man.poznan.pl/wiki/QosCosGrid_Tutorial
http://node2.qoscosgrid.man.poznan.pl/ gridsphere/gridsphere