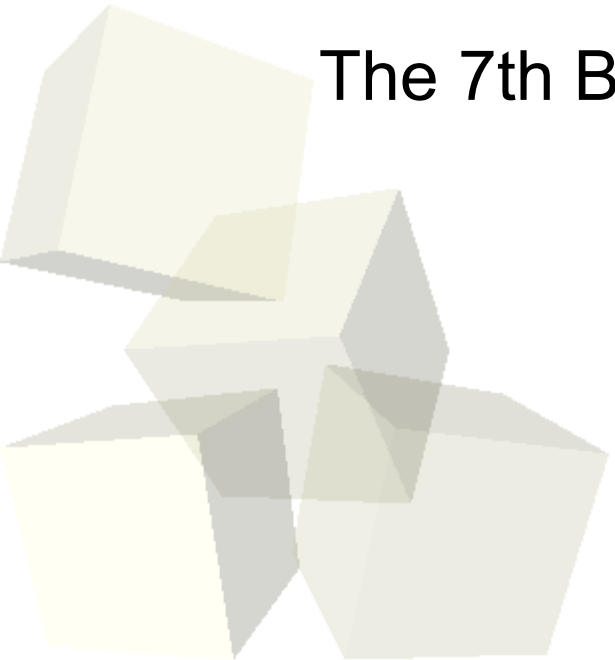




Web-based interface to desktop grid computing resources

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Karelian Research Centre of the RAS



- Established in 1975
- Major research trends:
 - ◆ mathematical and informational modelling for ecological, energy and other problems of the region
 - ◆ computer-aided design of transport and energy systems
 - ◆ simulation systems for power plants
 - ◆ study of renewable energy resources distribution in the region
 - ◆ study of hydrogen interaction with solids



- Established in 2009
- High-performance computing cluster and the system of data storage
- The main aim is to support development of fundamental and applied research as well as to organize teamwork with other organizations





■ SETI@home

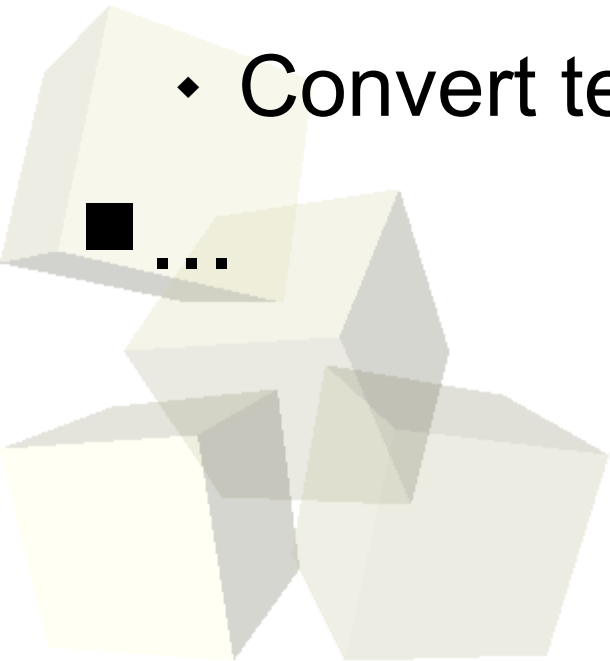
- ◆ Analyze data using the certain algorithms

■ Docking@Home

- ◆ Simulate interaction of molecular models

■ FreeHAL@home

- ◆ Convert texts into facts





- Cluster nodes, servers and desktop PCs
- The aim is to provide additional computational resources for data-parallelized applications
- Applications are unique and serve specific needs of different users
- Applications of a user change from time to time



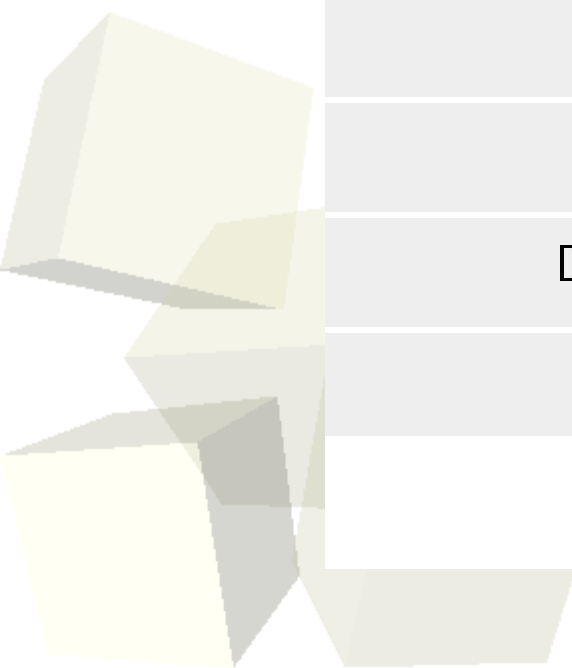
- RBoinc (GPUGRID.net)
 - ◆ Users submit jobs for the registered application
- Legion
 - ◆ Users submit tasks that can be divided into a number of BOINC workunits for the registered application
- BOINC API
 - ◆ Users submit batches of jobs for the registered application



- User's executable
- BOINC Wrapper (pre-compiled)
- Custom input template file
 - ◆ Number of input files
 - ◆ Logical filenames
 - ◆ Time/Memory/Disc usage estimates
 - ◆ ...
- Custom output template file
 - ◆ Number of output files
 - ◆ Logical filenames
 - ◆ ...



Short description:	<input type="text"/>
Executable file: <small>(compiled with -static option)</small>	<input type="text"/> <input type="button" value="Browse..."/>
Zip archive of additional files:	<input type="text"/> <input type="button" value="Browse..."/>
Input file(s) name(s):	<input type="text"/>
Zip archive of input files:	<input type="text"/> <input type="button" value="Browse..."/>
Output file(s) name(s):	<input type="text"/>
Time estimate:	<input type="text" value="30 minutes"/> ▾
Memory estimate:	<input type="text" value="16 Mb"/> ▾
Disc usage estimate:	<input type="text" value="16 Mb"/> ▾
E-mail address:	<input type="text"/>
	<input type="button" value="Send"/> <input type="button" value="Reset"/>



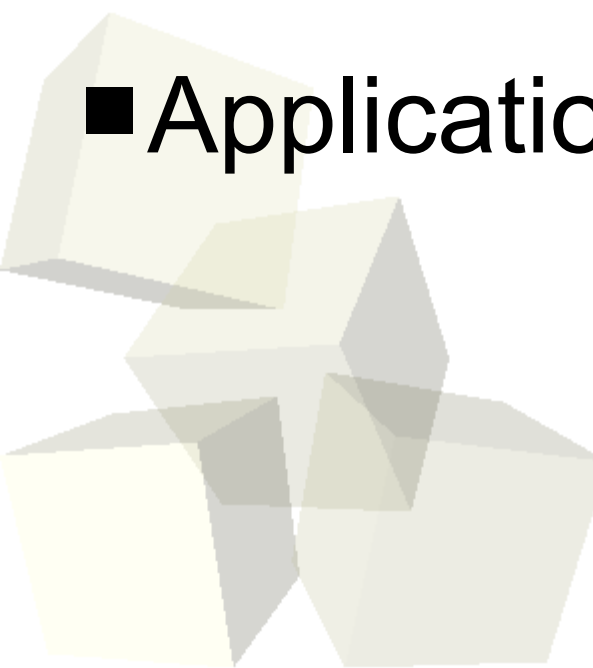


- User's executable and I/O parameters (PHP)
- Registration of the application (PHP + shell scripts)
 - ◆ edit **project.xml**
 - ◆ run **xadd**
 - ◆ create app directory
 - ◆ run **update_versions**
 - ◆ add assimilator and validator
 - ◆ update DB for user's applications
- Job submission (PHP + shell scripts)
 - ◆ Generate XML files for I/O templates
 - ◆ run **create_work**

- Validation
 - ◆ Sample trivial validator
- Assimilation
 - ◆ Write output files to the temporary directory
 - ◆ When all workunits are assimilated, set application status to "Ready but not sent" in DB for users applications
- Returning to the user
 - ◆ Check for "Ready but not sent" applications
 - ◆ Zip the output files and send them to user
 - ◆ Set application status to be "Ready and sent" in DB for users applications



- Security issues
- User's executable for different platforms
 - ◆ Upload source code and compile it at server/clients?
- Error handling is not fully implemented
- Job monitoring is not fully implemented
- Applications have equal priorities





More info at

http://grid.krc.karelia.ru/web_appwrapper/doc.html

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