Berkeley Open Infrastructure for Network Computing

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CoreGRID, WP4, System Architecture
What is Volunteer computing?

Science has tasks to do
Science requires enormous amount of resource to compute the tasks
Resource donated by home PC owners
Based on the internet
Why volunteer computing?

- Because it may accumulate huge amount of resource
- 1 billion PCs
  - 55% privately owned
  - most are on Internet
- If 100M participate:
  - > 100 PetaFLOPs, 1 Exabyte ($10^{18}$) storage
Volunteer computing != Grid computing

Resources can come and go at any time, connecting PCs are home PCs with firewalls, so they cannot be reached by the server. PCs must initiate connection themselves. Resources are donated, so costs are paid by the owners. The machines cannot be expected to have a predefined software stack, therefore the task to be executed on the PCs must not contain dependences.
What's different about volunteer computing?

- Must attract and retain volunteers, therefore it requires
  - Credit (system that compensates the user)
  - Community features (communication, user care)
  - Easy installation; autonomic (easy the participation)

- Volunteers are unreliable
  - one solution: redundant computing (task are calculated by several PC owner parallel)

- Heterogeneous, dynamic resource pool (client executables must be prepared for the most used platforms)
Early history

- **GIMPS (1996) [Great Internet Mersenne Prime search]**
  - George Woltman, Scott Kurowski
  - Last found the 44th prime in 2006 with 9808358 digits

- **distributed.net (1997)**
  - Adam Beberg, Jim Lawson, ...
  - Breaking the RSA code, done for 56 and 64 bits, now for 72

- **SETI@home (1999)**
  - David Anderson, Eric Korpela
  - Looking for Extraterrestrial Intelligence using telescopes, radio and optical to search the skies for signals
  - Research since 1960, SETI starts in 1979, Volunteer computing starts in 1999, more than 5 millions computer and 257 TFLOPS by 2006 dec.

- **Folding@Home (2000) [protein folding]**
  - Vijay Pande
  - Research for finding molecules that are usable to create medicine for different diseases (e.g. alzheimer, cancer, madcow, etc.)
Berkeley Open Infrastructure for Network Computing (BOINC)

- Started in 2002; funded by US National Science foundation (NSF)
  - 2.75 FTEs; lots of volunteers
- Open-source (LGPL)
  - client: 20K lines, C++
  - server: 10K lines, C++/Python
  - web: 10K lines, PHP
- http://boinc.berkeley.edu
Performance of BOINC projects

- 680,000 participants in 245 countries
- 1,000,000 computers
- 400 TeraFLOPS (more than BlueGene!)
- 12 Petabytes of free disk space
- SETI@home: 2.7 million years of computer time
- But the potential is much larger which is one of the goals of the 3rd BOINC workshop held in these days in Geneva!
Some BOINC-based projects

- Climateprediction.net
  - Oxford; climate change study
- Einstein@home
  - LIGO; gravitational wave astronomy
- Rosetta@home
  - U. Washington; protein study
- SETI@home
  - U.C. Berkeley; SETI
- LHC@home
  - CERN; accelerator simulation
- Africa@home
  - STI, U. of Geneva; malaria epidemiology
- IBM World Community Grid
  - several biomedical applications
- ...and about 30 others
volunteers “attach” computers to projects, allocate resources

SETI  Climate  physics  biomedical

Joe  Alice  Jens

projects

volunteers
Notions

- **Project**
  - A project is a group of one or more distributed applications, run by a single organization
    - e.g. SETI@home, LHC@home
  - Projects are independent; each one has its own applications, databases and servers, and is not affected by the status of other projects.
  - Identifier: Master URL
    - e.g. http://szdg.lpds.sztaki.hu/szdg

- **Application**
  - The distributed application that uses BOINC for computing subtasks
Notions

- **Application client**
  - A sequential program to be executed on a PC participating in a BOINC project. It computes a subtask (input data – computation – output data).

- **Platform**
  - different operating systems and hardware architectures on the PCs
  - different capabilities of PCs relevant for the given project (e.g. graphics card)
  
  e.g. windows_intelx86, linux_x86, macos_ppc, sparc_solaris
Notions

- Application version
  - An application program may go through a sequence of versions. A particular version, compiled for a particular platform, is called an application version.
  - Version numbers should be used consistently across platforms.
Application version

boinc@n24:~/projects/windowsboinc2$ ls -l apps/szdg/
total 36

<table>
<thead>
<tr>
<th>Mode</th>
<th>User</th>
<th>Group</th>
<th>Size</th>
<th>Date/Time</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 22 14:22</td>
<td>pkalc_4.01_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 22 14:25</td>
<td>pkalc_4.01_windows_intelx86.exe/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 26 11:30</td>
<td>pkalc_4.04_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 26 12:31</td>
<td>pkalc_4.05_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 27 10:01</td>
<td>pkalc_4.06_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 27 10:50</td>
<td>pkalc_4.07_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 27 12:38</td>
<td>pkalc_4.08_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 27 17:17</td>
<td>pkalc_4.09_i686-pc-linux-gnu/</td>
</tr>
<tr>
<td>drwxr-xr-x</td>
<td>boinc</td>
<td>boinc</td>
<td>4096</td>
<td>Apr 28 09:39</td>
<td>pkalc_4.10_i686-pc-linux-gnu/</td>
</tr>
</tbody>
</table>
Notions

- **Work unit**
  - One subtask definition, specifying the
    - application client
    - input files
    - resource needs (memory, disk, flops)
Notions

- Result
  - One package of a workunit that is sent to PCs for computation
    - does not contain “result” at that point
  - Defines the output file
  - Several results can be stored for one work unit
    - errors
    - see redundant computing
Infrastructure

for one BOINC project
BOINC infrastructure

- Project back end
  - supplies applications and work units, and handles the computational results
  - this is the distributed application that uses BOINC for computing subtasks

- Data server
  - HTTP server able to handle CGI programs with POST commands
  - third party can provide data servers

- BOINC server complex
  - Manages data distribution and collection.
  - It consists of
    - One or more scheduling servers
    - A relational database storing information about work, results, and participants
    - Utility programs and libraries that allow the project back end to interact with the server complex.
    - Web interfaces for participants and developers
BOINC infrastructure

- Server machine needs:
  - Apache for communication
  - MySQL database
  - PHP for web pages and communication with users (PC owners)

- Detailed info available on how to make projects/applications
  - http://boinc.berkeley.edu/create_project.php
1 server can handle 8-25 million tasks per day
BOINC core client

- Runs as
  - screen saver or
  - service (without user intervention) or
  - command-line (linux cron)

- Platforms
  - Windows (95 and up)
  - Linux
  - Solaris/SPARC
  - Mac OS X
Data Flow of BOINC

1) get instructions
2) download applications and input files
3) compute
4) upload output files
5) report results
Features of BOINC
Redundant computing

- A mechanism for identifying and rejecting erroneous results.
- A project can specify that $N$ results should be created for each workunit. Once $M \leq N$ of these have been distributed and completed, an application-specific function is called to compare the results and possibly select a **canonical result**.
- If no consensus is found, or if results fail, BOINC creates new results for the workunit, and continues this process until either a maximum result count or a timeout limit is reached.
Redundant computing

- If computation fails, new computers can do try it again (more robust overall system)
- Malicious users may try to send back false results. This can be cross-checked with other results.
- **SZDG:**
  - $N = 4$ (number of empty result to create initially)
  - min. quorum ($M$) = 3 (minimum number of equivalent results to form canonical result)
  - max. results = 6 (maximum number of empty results to create)
Failures and back-off

- Possibly millions of PCs
  - problem if they connect to the server at once and frequently (similar to a DDOS attack)
- Large workunits load individual PCs for a long time
  - one PC connects less frequently
- If no work or failure on server
  - core client does exponential back-off
- If application client code aborts immediately
  - core client connects back to server with a delay based on the number of failures
Participant preferences

- BOINC lets participants control how and when their resources are used
  - whether BOINC can do work while mouse/keyboard input is active
  - during what hours can BOINC do work
  - how much disk space can BOINC use
  - how much network bandwidth can BOINC use
  - preference for upload, download and combined transfer limits over arbitrary periods (considering DSL limits)
  - specify a duty cycle (floating-point intensive apps can cause CPU chips to overheat)
Participant preferences

- Edited in web form on the project’s web page
- Preferences are propagated to other projects in which the user participates
- Separate sets of preferences for computers at home, work, and school are possible.
Credit

- PC owners particularly interested in their ranking relative to other users
- Credit: a weighted combination of computation, storage, and network transfer.
- cross-project identification mechanism that allows accounts on different projects with the same email address to be identified
### Credit

**TOP 100 MULTI-PROJECT BOINC PARTICIPANTS**

The following users participate in two or more projects (5% or more of their recent average credit).

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Credits</th>
<th>RAC</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UW-Madison CAE</td>
<td>215514</td>
<td>1912</td>
<td>2094</td>
</tr>
<tr>
<td>2</td>
<td>CPDN</td>
<td>40926</td>
<td>216</td>
<td>5381</td>
</tr>
<tr>
<td>3</td>
<td>Einstein</td>
<td>25798</td>
<td>236</td>
<td>5399</td>
</tr>
<tr>
<td>4</td>
<td>Rosetta</td>
<td>652</td>
<td>30</td>
<td>3984</td>
</tr>
<tr>
<td>5</td>
<td>BOINC</td>
<td>282892</td>
<td>2396</td>
<td>2235</td>
</tr>
</tbody>
</table>

*BOINCStats*  
www.boincstats.com

**Users and total average credit**

![Graph showing credit accumulation over time]
## Top teams

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Members</th>
<th>Recent average credit</th>
<th>Total credit</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SETI-Germany</td>
<td>11466</td>
<td>94,908.71</td>
<td>32,872,231.16</td>
<td>Germany</td>
</tr>
<tr>
<td>2</td>
<td>Overclockers.com</td>
<td>1848</td>
<td>59,186.43</td>
<td>14,226,544.20</td>
<td>United States</td>
</tr>
<tr>
<td>3</td>
<td>BOINC Synergy</td>
<td>926</td>
<td>57,224.35</td>
<td>13,224,657.49</td>
<td>International</td>
</tr>
<tr>
<td>4</td>
<td>Hardware Upgrade - Seti@home</td>
<td>1138</td>
<td>56,960.91</td>
<td>12,429,151.02</td>
<td>Italy</td>
</tr>
<tr>
<td>5</td>
<td>SETI@Netherlands</td>
<td>5105</td>
<td>55,957.93</td>
<td>23,547,250.69</td>
<td>Netherlands</td>
</tr>
<tr>
<td>6</td>
<td>Czech National Team</td>
<td>1049</td>
<td>55,235.74</td>
<td>17,234,662.29</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>7</td>
<td>BroadbandReports.com Team Starfire</td>
<td>3346</td>
<td>53,462.61</td>
<td>17,128,970.57</td>
<td>International</td>
</tr>
<tr>
<td>8</td>
<td>OcUK - Overclockers UK</td>
<td>2329</td>
<td>49,419.71</td>
<td>28,856,919.99</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>L'Alliance Francophone</td>
<td>1231</td>
<td>43,870.75</td>
<td>14,277,523.04</td>
<td>International</td>
</tr>
<tr>
<td>10</td>
<td>The Knights Who Say Nil</td>
<td>1891</td>
<td>41,274.92</td>
<td>13,685,781.62</td>
<td>International</td>
</tr>
<tr>
<td>11</td>
<td>Universe Examiners</td>
<td>586</td>
<td>35,380.13</td>
<td>11,904,881.56</td>
<td>Finland</td>
</tr>
<tr>
<td>12</td>
<td>LittleWhiteDog</td>
<td>754</td>
<td>32,186.09</td>
<td>8,009,844.67</td>
<td>International</td>
</tr>
<tr>
<td>13</td>
<td>Team Are Technica Lamb Chop</td>
<td>6613</td>
<td>31,311.07</td>
<td>12,721,265.58</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Phoenix Rising</td>
<td>717</td>
<td>29,031.31</td>
<td>9,124,391.75</td>
<td>International</td>
</tr>
</tbody>
</table>
View of BOINC (client)
Participating in a BOINC project

- Visit projects web page
- Register (with email address)
- Receive a userID by email
- Validate registration
- Download BOINC Core client for your platform
- Install and run core client
- Give project URL and userID to the core client to connect to the project
BOINC client software: simple view
BOINC client software: preferences menu

- Skin: Default

Preferences:
- I want to customize my preferences for this computer only.

Customized Preferences:
- Do work only between: Anytime and 0:00
- Connect to internet only between: Anytime and 0:00
- Use no more than: 100 GB of disk space
- Use no more than: 100% of the processor
- Do work while on battery?: Yes
- Do work after idle for: 0 (Run Always) minutes

Buttons: Save, Cancel
BOINC client software: advanced view / projects tab
BOINC client software: advanced view / tasks tab
BOINC client software: advanced view / messages tab
BOINC client software: advanced view / statistics tab
BOINC client: attach project wizzard

Attach to project
Well now guide you through the process of attaching to a project.

To continue, click Next.

Communicating with project
Please wait...

Attached to project
You are now successfully attached to this project. Click Finish to close.
BOINC homepage: setting preferences
BOINC project homepage
project server status webpage

SZTAKI Desktop Grid Status Page

Server State

<table>
<thead>
<tr>
<th>Program</th>
<th>Host</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Webpage</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Scheduler</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Assimilator / WU generator #1</td>
<td>szdg</td>
<td>Stopped</td>
</tr>
<tr>
<td>Assimilator / WU generator #2</td>
<td>szdg</td>
<td>Stopped</td>
</tr>
<tr>
<td>Assimilator / WU generator #3</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Assimilator / WU generator #4</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Assimilator / WU generator #5</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Assimilator / WU generator #6</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Feeder</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>File delater</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Transitioner</td>
<td>szdg</td>
<td>Running</td>
</tr>
<tr>
<td>Validator for Num-SysSearch</td>
<td>szdg</td>
<td>Running</td>
</tr>
</tbody>
</table>

Database Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Approximate # of WUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready to send</td>
<td>65,846</td>
</tr>
<tr>
<td>In progress</td>
<td>26,108</td>
</tr>
</tbody>
</table>
Running command-line BOINC (client)
Running a command-line client

Kanuka:~/Projects/_sztaki/_szdg/_clients/level0/atisu$ ./boinc --attach_project http://mactel.virtdomain/level0/ 59da6a6792c6c4d1c7e536369365e470
2007-09-03 16:49:27 [----] Starting BOINC client version 5.6.4 for i686-apple-darwin
2007-09-03 16:49:27 [----] log flags: task, file_xfer, sched_ops
2007-09-03 16:49:27 [----] Libraries: libcurl/7.16.1 OpenSSL/0.9.8d zlib/1.2.3
2007-09-03 16:49:27 [----] Data directory: /Users/atisu/Projects/_sztaki/_szdg/_clients/level0
2007-09-03 16:49:27 [----] Processor: 2 i386 MacBookPro2,2
2007-09-03 16:49:27 [----] Memory: 2.00 GB physical, 0 bytes virtual
2007-09-03 16:49:27 [----] Disk: 91.00 GB total, 1.04 GB free
2007-09-03 16:49:27 [----] Already attached to http://mactel.virtdomain/level0/
2007-09-03 16:49:27 [level0] URL: http://mactel.virtdomain/level0/; Computer ID: not assigned yet; location: (none); project prefs: default
2007-09-03 16:49:27 [----] No general preferences found - using BOINC defaults
2007-09-03 16:49:27 [level0] Fetching scheduler list
2007-09-03 16:49:29 [----] Running CPU benchmarks
Running a command-line client

Kanuka:/Projects/ztaki/_szdg/clients/level0 atisu$ /boinc --attach_project http://mactel.virtdomain/level0/ 59da0a6792c6c4d1c7e536389365e470
2007-09-03 16:49:27 [----] Starting BOINC client version 5.6.4 for 1686-apple-darwin
2007-09-03 16:49:27 [----] log flags: task, file_xfer, sched_ops
2007-09-03 16:49:27 [----] Libraries: libcurl/7.16.1 OpenSSL/0.9.8d zlib/1.2.3
2007-09-03 16:49:27 [----] Data directory: /Users/atisu/Projects/ztaki/_szdg/clients/level0
2007-09-03 16:49:27 [----] Processor: 2 1386 MacBookPro2,2
2007-09-03 16:49:27 [----] Memory: 2.00 GB physical, 0 bytes virtual
2007-09-03 16:49:27 [----] Disk: 91.00 GB total, 1.84 GB free
2007-09-03 16:49:27 [----] Already attached to http://mactel.virtdomain/level0/
2007-09-03 16:49:27 [level0] URL: http://mactel.virtdomain/level0/; Computer ID: not assigned yet; location: (none); project prefs: default
2007-09-03 16:49:27 [----] No general preferences found - using BOINC defaults
2007-09-03 16:49:27 [level0] Fetching scheduler list
2007-09-03 16:49:29 [----] Running CPU benchmarks
2007-09-03 16:49:32 [level0] Master file download succeeded
2007-09-03 16:49:37 [level0] Sending scheduler request: Project initialization
2007-09-03 16:49:37 [level0] Requesting 1 seconds of new work
Running a command-line client

kanuka:~/Projects/_sztki/_szdg/_clients/level0 atsu$ /boinc --attach_project http://mactel.virtdomain/level0/ 59da0a5792c6c4d1c7e536389365e478
2007-09-03 16:49:27 [---] Starting BOINC client version 5.6.4 for i686-apple-darwin
2007-09-03 16:49:27 [---] log flags: task, file_xfer, sched_ops
2007-09-03 16:49:27 [---] Libraries: libcurl/7.16.1 OpenSSL/0.9.8d zlib/1.2.3
2007-09-03 16:49:27 [---] Data directory: /Users/atsu/Projects/_sztki/_szdg/_clients/level0
2007-09-03 16:49:27 [---] Processor: 2 1386 MacBookPro2,1
2007-09-03 16:49:27 [---] Memory: 2.00 GB physical, 0 bytes virtual
2007-09-03 16:49:27 [---] Disk: 91.00 GB total, 1.84 GB free
2007-09-03 16:49:27 [---] Already attached to http://mactel.virtdomain/level0/
2007-09-03 16:49:27 [level0] URL: http://mactel.virtdomain/level0/; Computer ID: not assigned yet; location: (none); project prefs: default
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2007-09-03 16:49:29 [---] Running CPU benchmarks
2007-09-03 16:49:32 [level0] Master file download succeeded
2007-09-03 16:49:37 [level0] Sending scheduler request: Project initialization
2007-09-03 16:49:37 [level0] Requesting 1 seconds of new work
2007-09-03 16:49:47 [level0] Scheduler RPC succeeded [server version 506]
2007-09-03 16:49:49 [level0] Started download of file uppercase_1.01_i686-apple-darwin
2007-09-03 16:49:49 [level0] Started download of file wu_00000
2007-09-03 16:49:55 [level0] Finished download of file uppercase_1.01_i686-apple-darwin
2007-09-03 16:49:55 [level0] Throughput 141229 bytes/sec
2007-09-03 16:49:55 [level0] Finished download of file wu_00000
2007-09-03 16:49:55 [level0] Throughput 24 bytes/sec
Running a command-line client

kanuka:/Projects/_sztaki/_szdg/_clients/level0 atisu$ ./boinc --attach_project http://macel.virtdomain/level0/ 59da80a67f92c6c4d1c7e536389365e470
2007-09-03 16:49:27 [---] Starting BOINC client version 5.6.4 for i686-apple-darwin
2007-09-03 16:49:27 [---] log flags: task, file_xfer, sched_ops
2007-09-03 16:49:27 [---] Libraries: libcurl/7.16.1 OpenSSL/0.9.8d zlib/1.2.3
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2007-09-03 16:49:27 [level0] Fetching scheduler list
2007-09-03 16:49:29 [---] Running CPU benchmarks
2007-09-03 16:49:32 [level0] Master file download succeeded
2007-09-03 16:49:37 [level0] Sending scheduler request: Project initialization
2007-09-03 16:49:37 [level0] Requesting 1 seconds of new work
2007-09-03 16:49:47 [level0] Scheduler RPC succeeded [server version 506]
2007-09-03 16:49:49 [level0] Started download of file uppercase_1.01_i686-apple-darwin
2007-09-03 16:49:49 [level0] Started download of file wu_00000
2007-09-03 16:49:55 [level0] Finished download of file uppercase_1.01_i686-apple-darwin
2007-09-03 16:49:55 [level0] Throughput 141229 bytes/sec
2007-09-03 16:49:55 [level0] Finished download of file wu_00000
2007-09-03 16:49:55 [level0] Throughput 24 bytes/sec
2007-09-03 16:50:28 [---] Benchmark results:
2007-09-03 16:50:28 [---] Number of CPUs: 2
2007-09-03 16:50:28 [---] 1468 floating point MIPS (Whetstone) per CPU
2007-09-03 16:50:28 [---] 4133 integer MIPS (Ohrystone) per CPU
2007-09-03 16:50:28 [---] Finished CPU benchmarks
2007-09-03 16:50:29 [---] Starting wu_00000_wu_0
2007-09-03 16:50:29 [level0] Starting task wu_00000_wu_0 using uppercase version 101
2007-09-03 16:50:30 [level0] Computation for task wu_00000_wu_0 finished
2007-09-03 16:50:32 [level0] Started upload of file wu_00000_wu_0_0
Appearance of BOINC (server)
Project info page for the operator

**SZTAKI Desktop Grid: Project Management**

- Latest SVN revision: 13529
- There are 0 remaining candidates for User of the Day.

### Browse database:
- Platforms
- Applications
- Application versions
- Users
- Teams
- Hosts
- Workunits
- Results

### Regular Operations:
- Screen user profiles
- Manage special users

### Special Operations:
- Manage applications
- Manage application versions
- Send mass email to a selected set of users
- Email user with misconfigured host
- FLOP count statistics
- Cancel workunits
- Manage user
- ID:

### Result summary for search:
- Past 24 hours: summary | pass percentage by platform | failure by host | failure by platform
- Past 7 days: summary | pass percentage by platform | failure by host | failure by platform

Show deprecated applications

### Periodic or special tasks
- The following scripts should be run as periodic tasks, not via this web page (see http://boinc.berkeley.edu/trac/wiki/ProjectTasks):
  - update_forum_activities.php, update_profile_pages.php, update_uotd.php
- The following scripts can be run manually on the command line as needed (i.e. php scriptname.php):

Stripcharts | Show/Grep all logs | Tail MySQL logs
Server info pages for the operator

Query workunit table

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>create_time</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>appid</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>762</td>
</tr>
<tr>
<td>xml_doc</td>
<td>blob</td>
<td>65535</td>
</tr>
<tr>
<td>batch</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>rsc.fpops_est</td>
<td>real</td>
<td>22</td>
</tr>
</tbody>
</table>

Description of workunit table fields:

<table>
<thead>
<tr>
<th>NAME</th>
<th>Type</th>
<th>Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>rsc.fpops_bound</td>
<td>real</td>
<td>22</td>
</tr>
<tr>
<td>rsc.memory_bound</td>
<td>real</td>
<td>22</td>
</tr>
<tr>
<td>rsc.disk_bound</td>
<td>real</td>
<td>22</td>
</tr>
<tr>
<td>need_validate</td>
<td>int</td>
<td>6</td>
</tr>
<tr>
<td>canonical_resultid</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>canonical_credit</td>
<td>real</td>
<td>22</td>
</tr>
<tr>
<td>transition_time</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>delay_bound</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>error_mask</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>file_delete_state</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>assimilate_state</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>hr.class</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>opaque</td>
<td>real</td>
<td>22</td>
</tr>
<tr>
<td>min_quorum</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>target_nresults</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>max_error_results</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>max_total_results</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>max_success_results</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>result_template_file</td>
<td>string</td>
<td>189</td>
</tr>
<tr>
<td>priority</td>
<td>int</td>
<td>11</td>
</tr>
<tr>
<td>mod_time</td>
<td>timestamp</td>
<td>19</td>
</tr>
</tbody>
</table>
Server info pages for the operator

**SZTAKI Desktop Grid: Users**

Query: select * from user limit 20

19244 records match the query. Displaying 1 to 20.

<table>
<thead>
<tr>
<th>ID</th>
<th>Created</th>
<th>Name</th>
<th>Authenticator</th>
<th>Email address</th>
<th>Country</th>
<th>Postal code</th>
<th>Total credit</th>
<th>Average credit</th>
<th>Last average time</th>
<th>Default venue</th>
<th>Hosts</th>
<th>Cross project ID</th>
<th>Password Hash</th>
<th>Donated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25 May 2005 11:51:19 UTC</td>
<td>vida</td>
<td>ddc126c0a1317f764acc805625d580b</td>
<td><a href="mailto:vida@sztaki.hu">vida@sztaki.hu</a></td>
<td>Hungary</td>
<td>1118</td>
<td>5608.80281</td>
<td>0</td>
<td>1 Mar 2007 16:10:12 UTC</td>
<td>home</td>
<td>click</td>
<td>915ec8b32a8a78f6d7b95571265386cd</td>
<td>e629be7aaf60ef0d9f7ff66b69359644</td>
<td>0</td>
</tr>
</tbody>
</table>
Server info pages for the operator

Results for computer

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Work unit ID</th>
<th>Sent</th>
<th>Time reported or deadline</th>
<th>Server state</th>
<th>Outcome</th>
<th>Client state</th>
<th>CPU time (sec)</th>
<th>claimed credit</th>
<th>granted credit</th>
</tr>
</thead>
</table>
Thank you for your attention!

- **Acknowledgement**
  - This presentation has been compiled using the slides downloaded from the BOINC site
  - [http://boinc.berkeley.edu/trac/wiki/BoincPapers](http://boinc.berkeley.edu/trac/wiki/BoincPapers)

- Special thank to David Anderson for the slides!

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