

EDGeS

SZTAKI Desktop Grid – an extended BOINC system

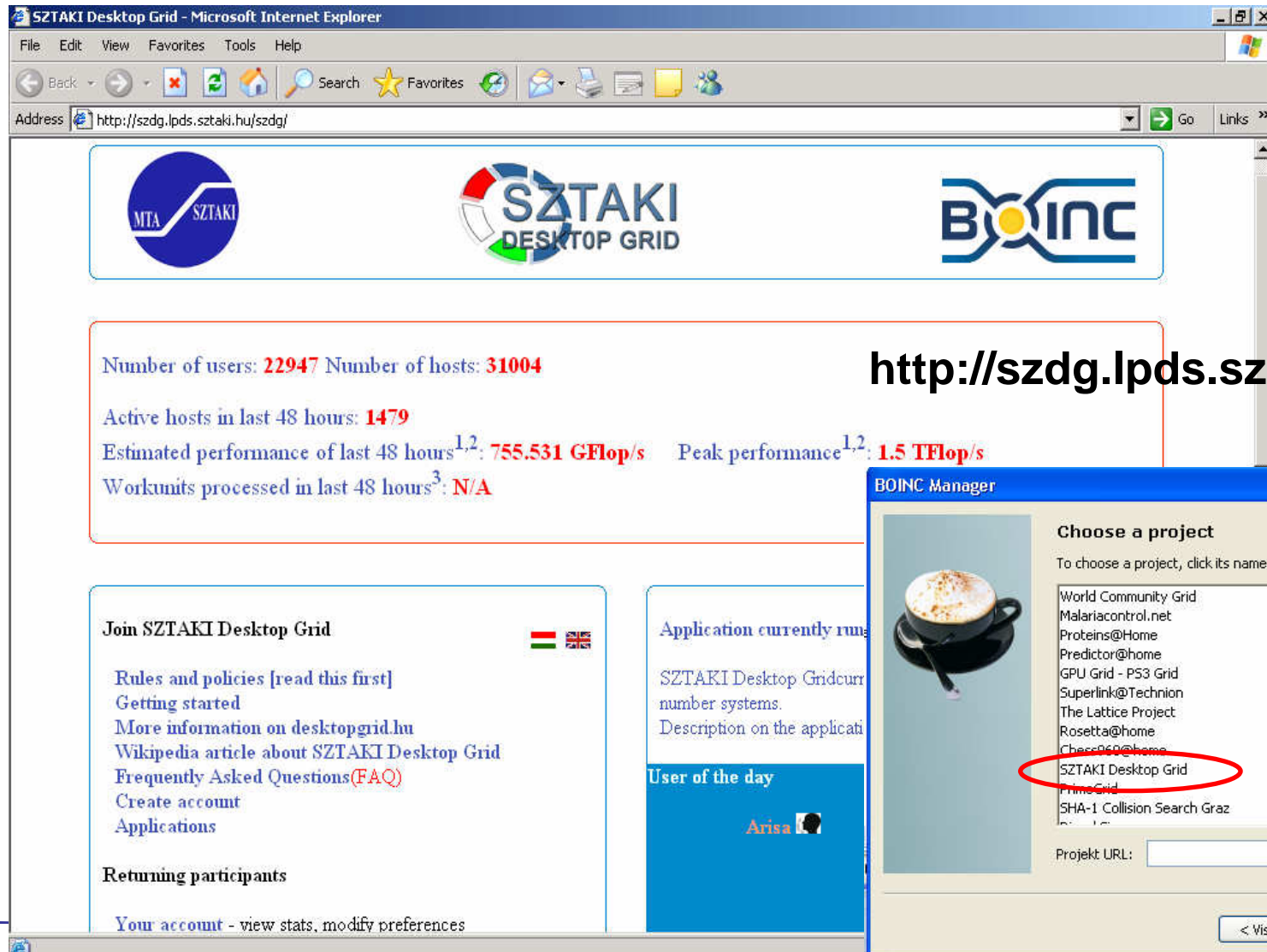
**József Kovács,
smith@sztaki.hu
MTA SZTAKI**



The EDGeS project receives Community research funding



SZTAKI Desktop Grid: public BOINC project



SZTAKI Desktop Grid - Microsoft Internet Explorer

Address: <http://szdg.lpd.sztaki.hu/szdg/>

MTA SZTAKI SZTAKI Desktop Grid BOINC

Number of users: **22947** Number of hosts: **31004**

Active hosts in last 48 hours: **1479**

Estimated performance of last 48 hours^{1,2}: **755.531 GFlop/s** Peak performance^{1,2}: **1.5 TFlop/s**

Workunits processed in last 48 hours³: **N/A**

Join SZTAKI Desktop Grid

Rules and policies [read this first]
Getting started
More information on desktopgrid.hu
Wikipedia article about SZTAKI Desktop Grid
Frequently Asked Questions (FAQ)
Create account
Applications

Returning participants

Your account - view stats, modify preferences

Application currently running

SZTAKI Desktop Grid currently runs on a number of systems.
Description on the application

User of the day

Arisa

BOINC Manager

Choose a project

To choose a project, click its name or type its URL below.

- World Community Grid
- Malariacontrol.net
- Proteins@Home
- Predictor@home
- GPU Grid - PS3 Grid
- Superlink@Technion
- The Lattice Project
- Rosetta@home
- Chess@Home
- SZTAKI Desktop Grid**
- PrimeGrid
- SHA-1 Collision Search Graz

Projekt URL:

< Vissza Előre > Mégsem

<http://szdg.lpd.sztaki.hu/szdg>



SZTAKI Desktop Grid: public BOINC project

SZDG is an “umbrella” project that collects applications from various scientific fields, which are currently:

- Binsys
 - Goal
 - finding all the generalized binary number systems up to dimension 10,11,12...
 - Developed by
 - [Eotvos Lorand University](#), Faculty of Informatics, [Department of Computer Algebra](#)
 - Scientific Area
 - mathematics
- UC-Explorer
 - Goal
 - exploring universality classes of nonequilibrium statistical physics
 - Developed by
 - Research Institute for Technical Physics and Materials Science (MFA)
 - Scientific Area
 - physics



SZTAKI Desktop Grid: BOINC extensions

SZTAKI Desktop Grid is a collection of various developments towards Desktop Grid direction, based on BOINC:

- **Debian packages** of the BOINC server
 - for volunteer computing: SZDG package
 - for private desktopgrid computing: Local SZDG package
- application programming interface: **DC-API**
- integration with various backends: e.g: **Condor**
- supporting various application types on the client side: e.g.: **Java, MPI**
- aggregating the power of different BOINC projects: **hierarchically** connected DGs
- ease the application porting under BOINC client: **genwrapper**
- improving security: introducing **certificates** in BOINC, **sandboxing** under BOINC client
- WU creation/forwarding jobs to boinc: **3GBridge** on BOINC server

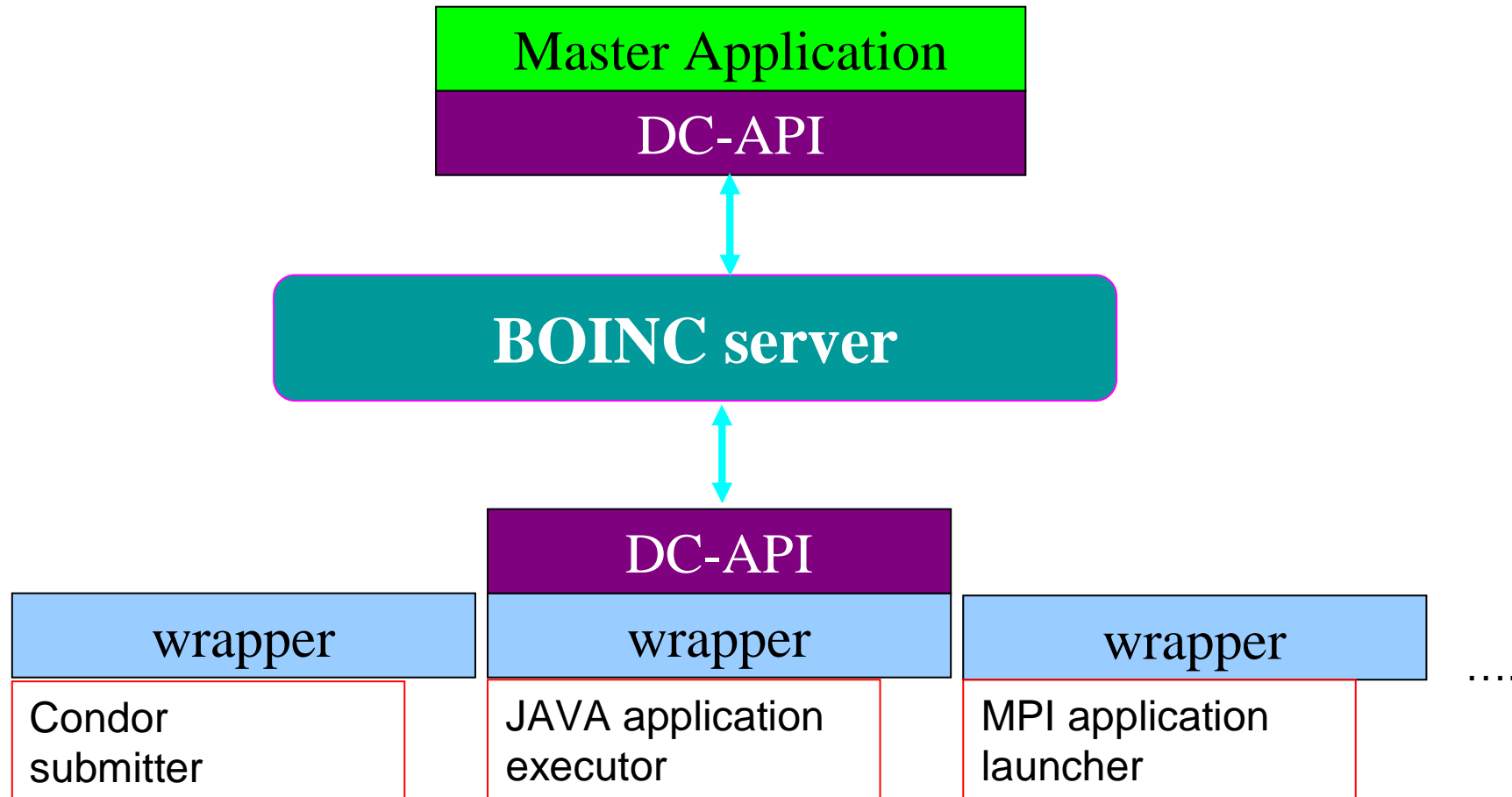


SZDG and Local SZDG packages

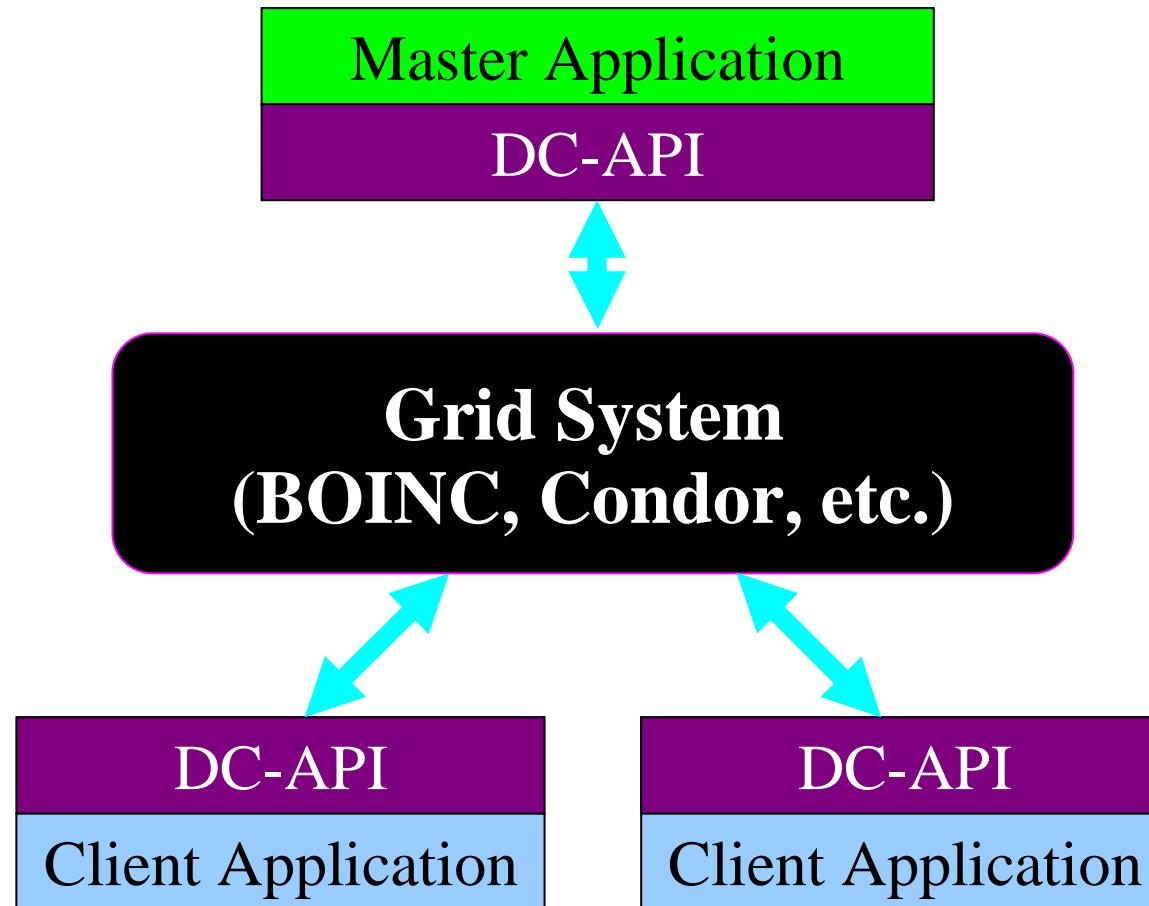
- **SZTAKE Desktop Grid** is basically a BOINC server packed in a Debian® package, to make server deployment as easy as possible. The SZTAKE Desktop Grid package is the main software component of a public, worldwide accessible desktop grid system. To effectively aid massive number of participants an extensive website component is part of this package.
- **Local SZTAKE Desktop Grid** is also a BOINC server packed in a Debian® package, that focuses on local applications - like companies or university departments - providing them the flexibility of a desktop grid in a **safe environment**. In a local environment a system administrator supervises the server as well as the clients. The Local SZTAKE Desktop Grid package is a BOINC server without the public web interface, to be deployed in a local environment. Multiple Local SZTAKE Desktop Grids can be connected to cooperate in a hierarchy of desktop grids. For more information on the hierarchy topic, please contact the [Laboratory of Paralel and Distributed Systems](#).

Condor, Java, MPI...

Integration with various backends:



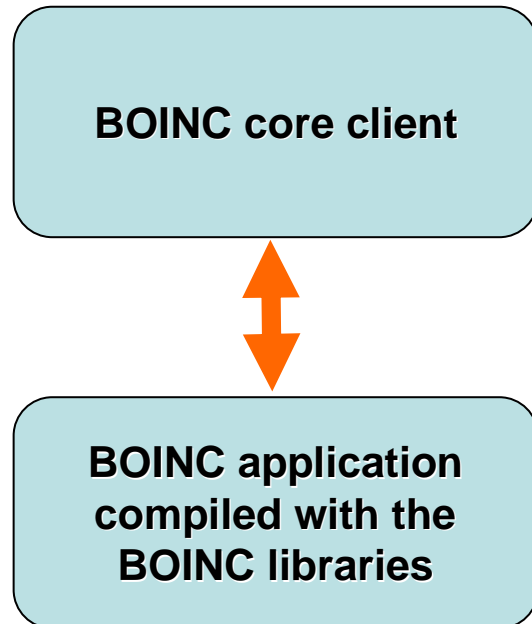
DC-API: Programming interface



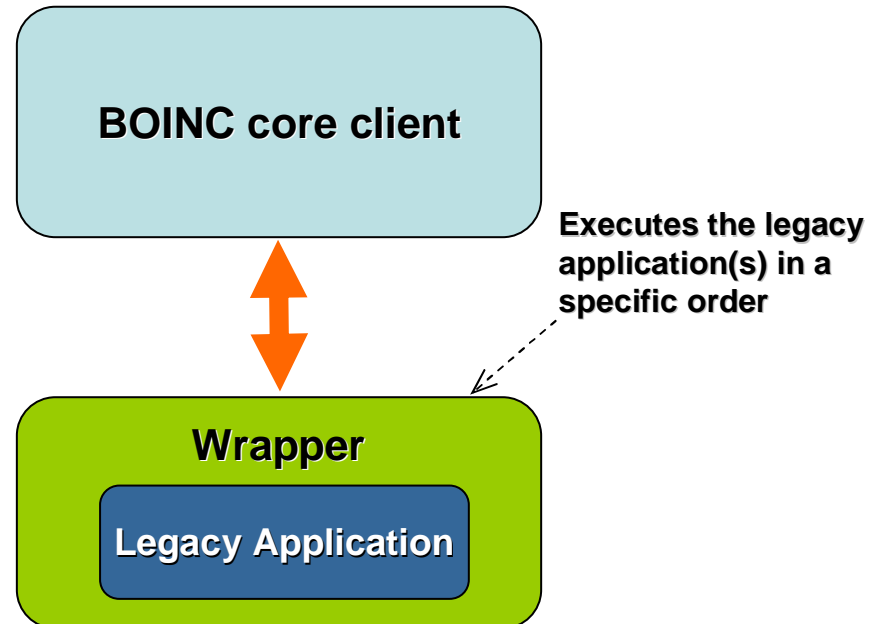
For details listen to the presentation:
09:30 Programming SZTAKI Desktop Grid and XtremWeb by DC-API (30')
József Kovács (Thursday)

GenWrapper: Wrapper Structure

Without the Wrapper



With the Wrapper

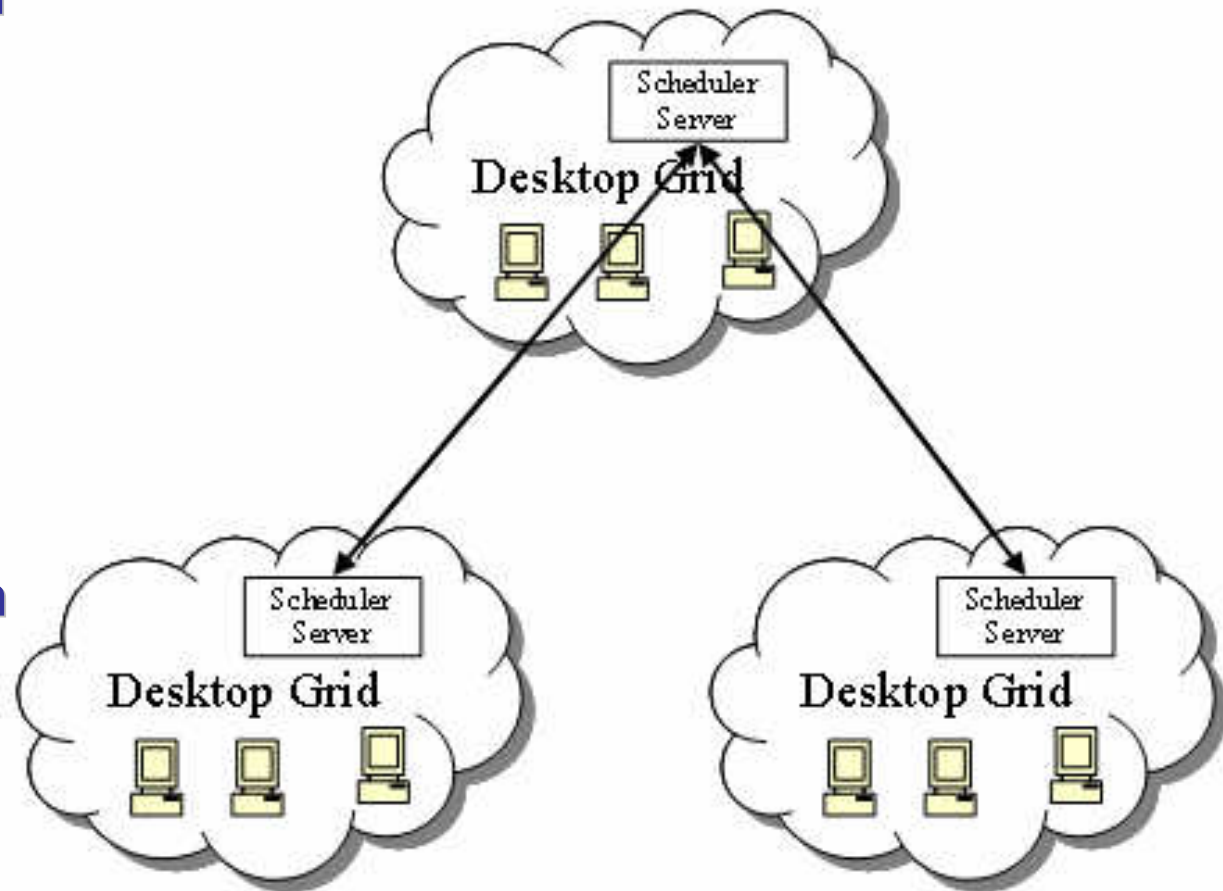


For details listen to the presentation:

10:20 GenWrapper and its usage for porting legacy applications to SZTAKI Desktop Grid (40') Attila Marosi (Thursday)

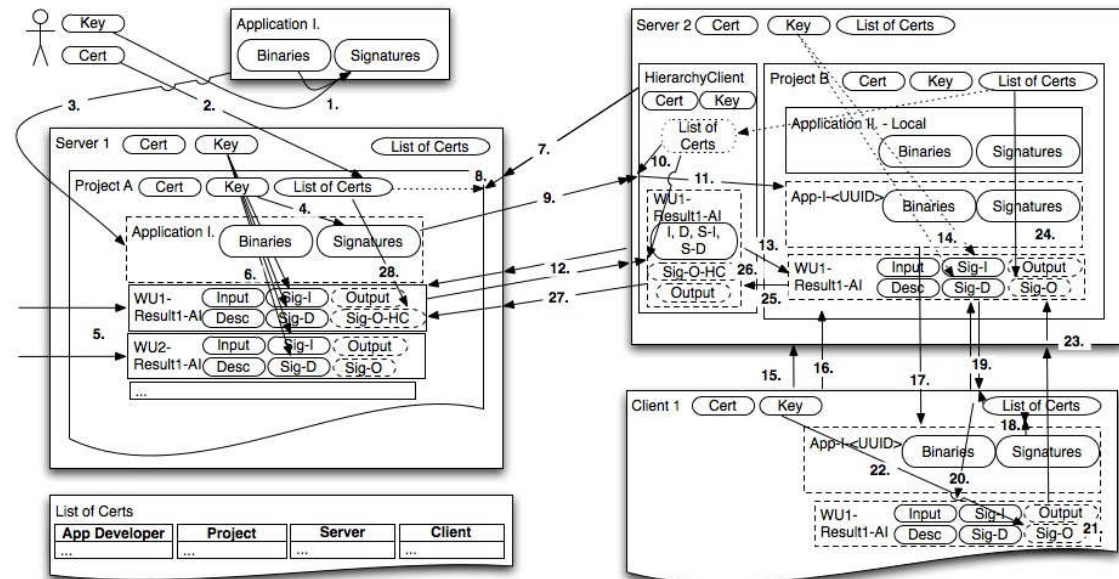
Hierarchically connected DGs

- **Implementation by a special BOINC client**
- **The special BOINC client is running on the server of the lower level BOINC project**
- **Takes WUs from the upper level and insert them into the lower level project**



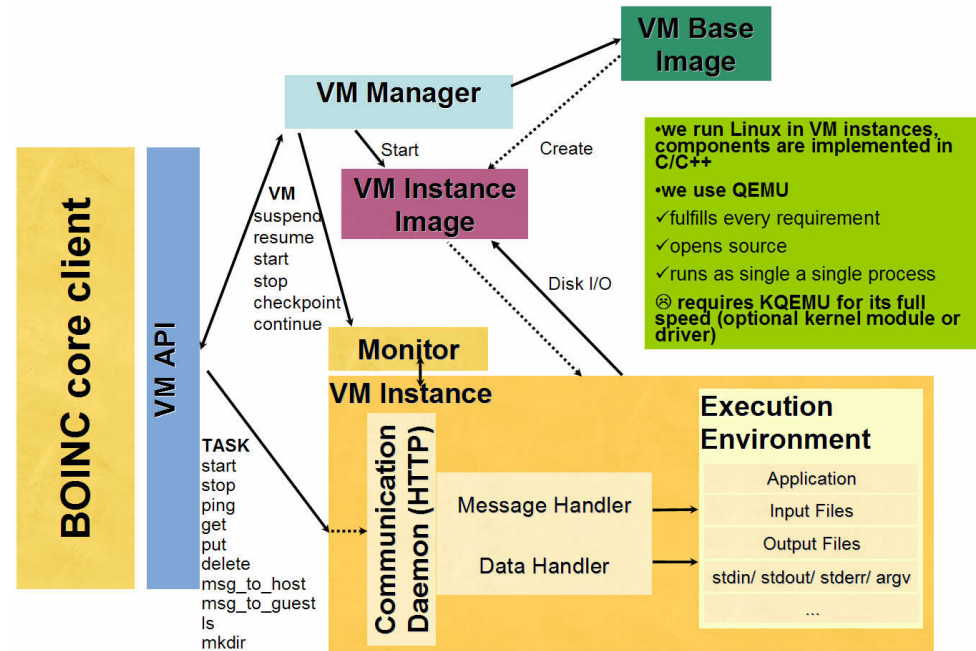
Certificate

- Trust relationship is implemented using signature checking
 - Every application comes with a set of signatures from entities who have authorized its use (app. developer, project, institute etc.)
 - Every client has a set of accepted certificates
 - An application is allowed to run if the intersection of the above sets is not empty
- We needed a PKI for managing the signing process – we've chosen X.509
- Part of the official BOINC release



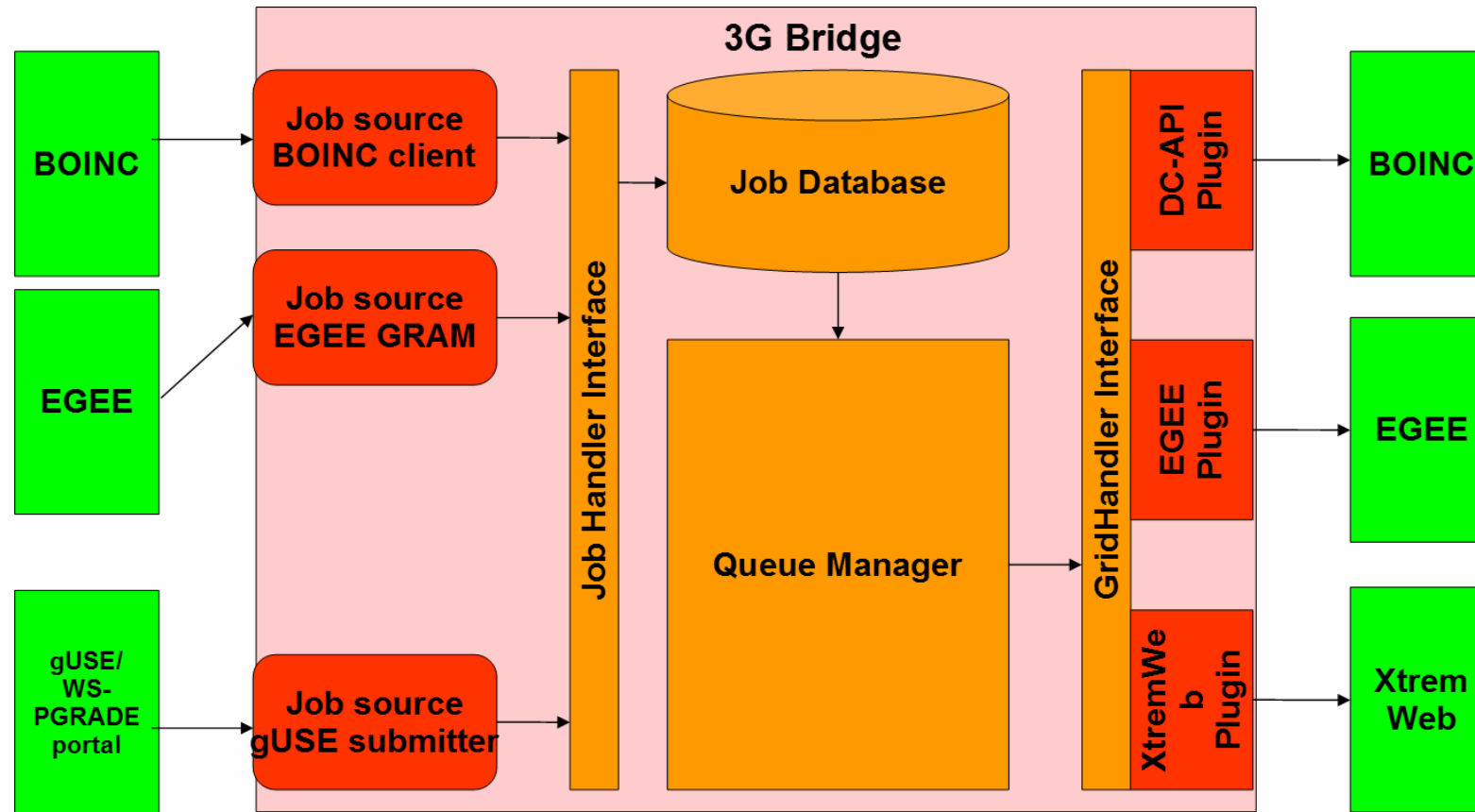
Sandboxing

- BOINC already contains code to run applications under a restricted account
- Sometimes this is not enough
- As a joint research between SZTAKI, INRIA and IN2P3 we've experimented with using virtual machines



- VM images are big – create them on the spot
 - Distribute a base image, and inject the input files on the client
 - Further ideas: use an embedded Linux distro instead of a desktop/server one (dietlibc, uClibc if possible)
- Either some software that can plug into the kernel has to be installed on the client or it will be slow
- Extended resource usage, more expensive checkpoints

Generic Grid-Grid (3G) Bridge to integrate SGs and DGs



For details listen to the presentation:

11:00 Service Grid – Desktop Grid bridges (20') Zoltán Farkas (Wednesday)



If you need more detailed (technical) information,
email to desktopgrid@lpds.sztaki.hu or
visit www.desktopgrid.hu

Thank you for your attention!
Questions?

