



Enabling Grids for E-science

Application Porting Support in EGEE

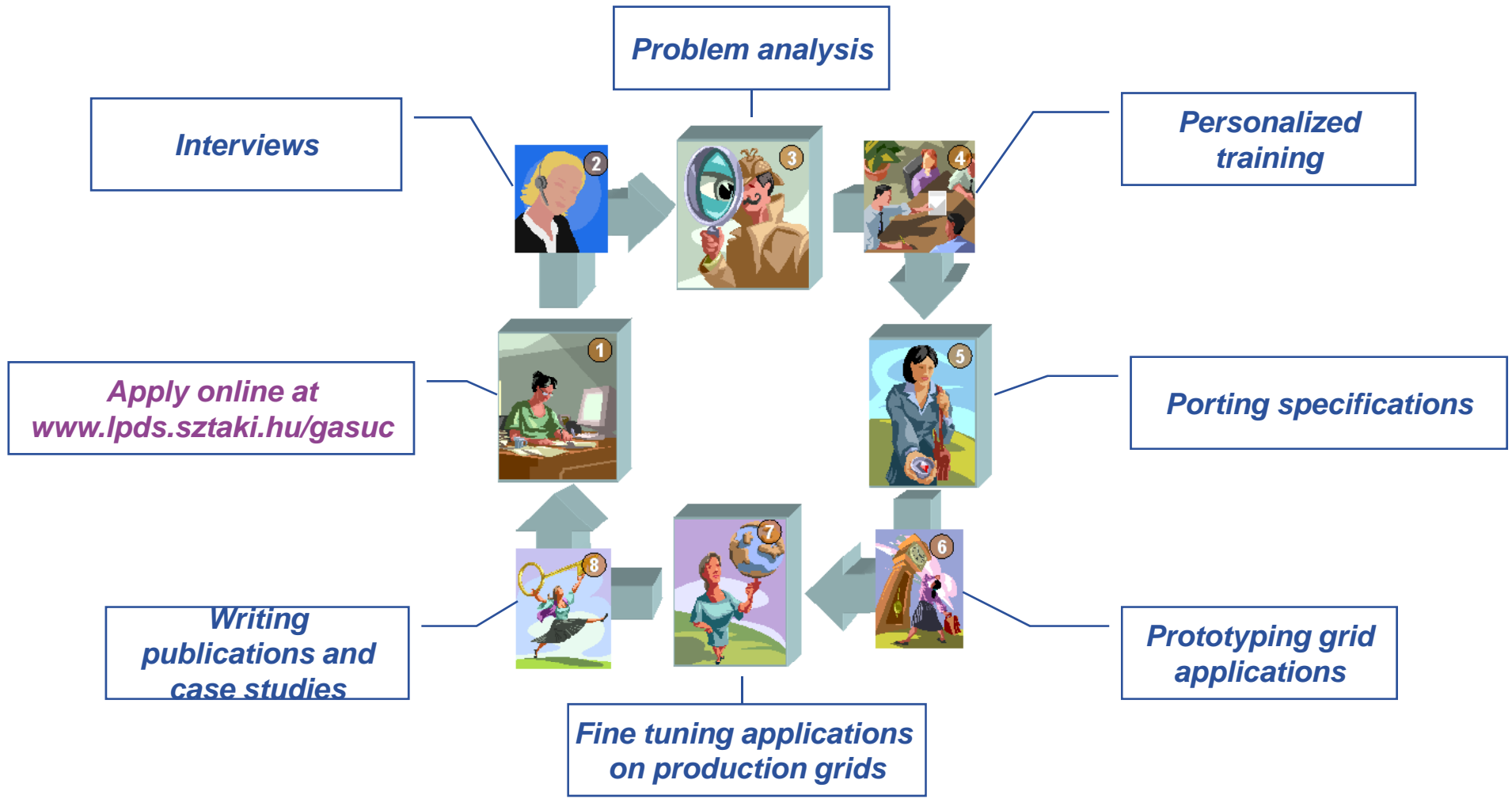
Gergely Sipos
MTA SZTAKI
sipos@sztaki.hu

EGEE'08 Conference
Istanbul, 22-26 September 2008

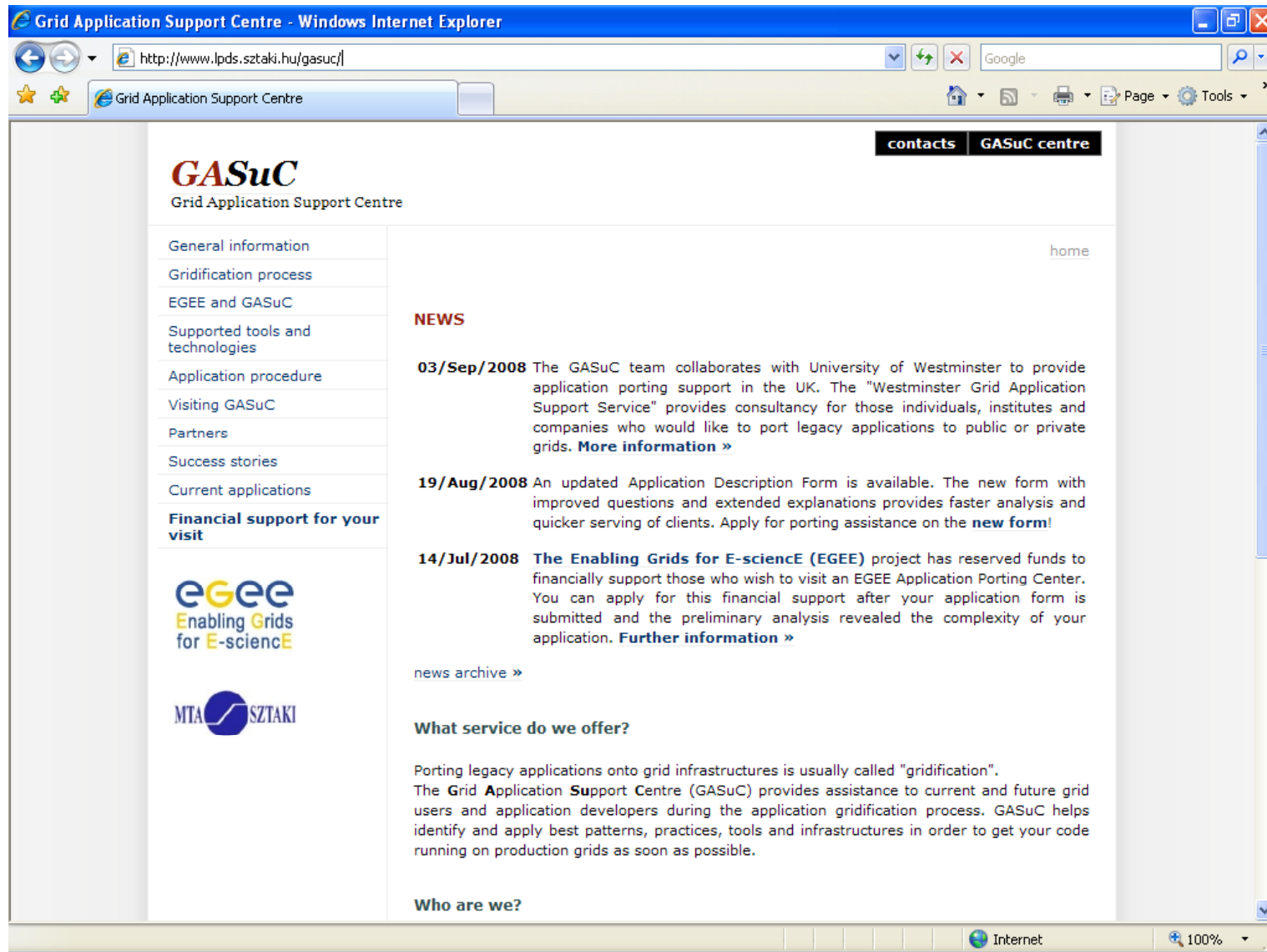
www.eu-egee.org



- **MTA SZTAKI, Budapest**
 - Grid Application Support Center (GASuC)
 - <http://www.lpds.sztaki.hu/gasuc>
- **INFN, Catania**
 - GILDA Team
 - <https://gilda.ct.infn.it/>
- **UCM, Madrid**
 - Distributed Systems Architecture Research Group
 - <http://asds.dacya.ucm.es/doku.php?id=start>
- **CSIC, Santander**
 - Institute of Physics of Cantabria
 - <http://grid.ifca.es/>
- **ASGC, Taipei**
 - Academia Sinica Grid Computing
 - <http://grid.sinica.edu.tw/>



Visit porting centre to make the cycle more effective!



The screenshot shows a web browser window titled "Grid Application Support Centre - Windows Internet Explorer". The address bar contains "http://www.lpds.sztaki.hu/gasuc/". The browser's toolbar includes navigation buttons, a search box with "Google", and various utility icons. The website content is displayed in a light blue and white theme.

contacts **GASuC centre**

GASuC
Grid Application Support Centre

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Enabling Grids
for E-science

MTA SZTAKI

NEWS

03/Sep/2008 The GASuC team collaborates with University of Westminster to provide application porting support in the UK. The "Westminster Grid Application Support Service" provides consultancy for those individuals, institutes and companies who would like to port legacy applications to public or private grids. **More information »**

19/Aug/2008 An updated Application Description Form is available. The new form with improved questions and extended explanations provides faster analysis and quicker serving of clients. Apply for porting assistance on the **new form!**

14/Jul/2008 **The Enabling Grids for E-science (EGEE)** project has reserved funds to financially support those who wish to visit an EGEE Application Porting Center. You can apply for this financial support after your application form is submitted and the preliminary analysis revealed the complexity of your application. **Further information »**

news archive »

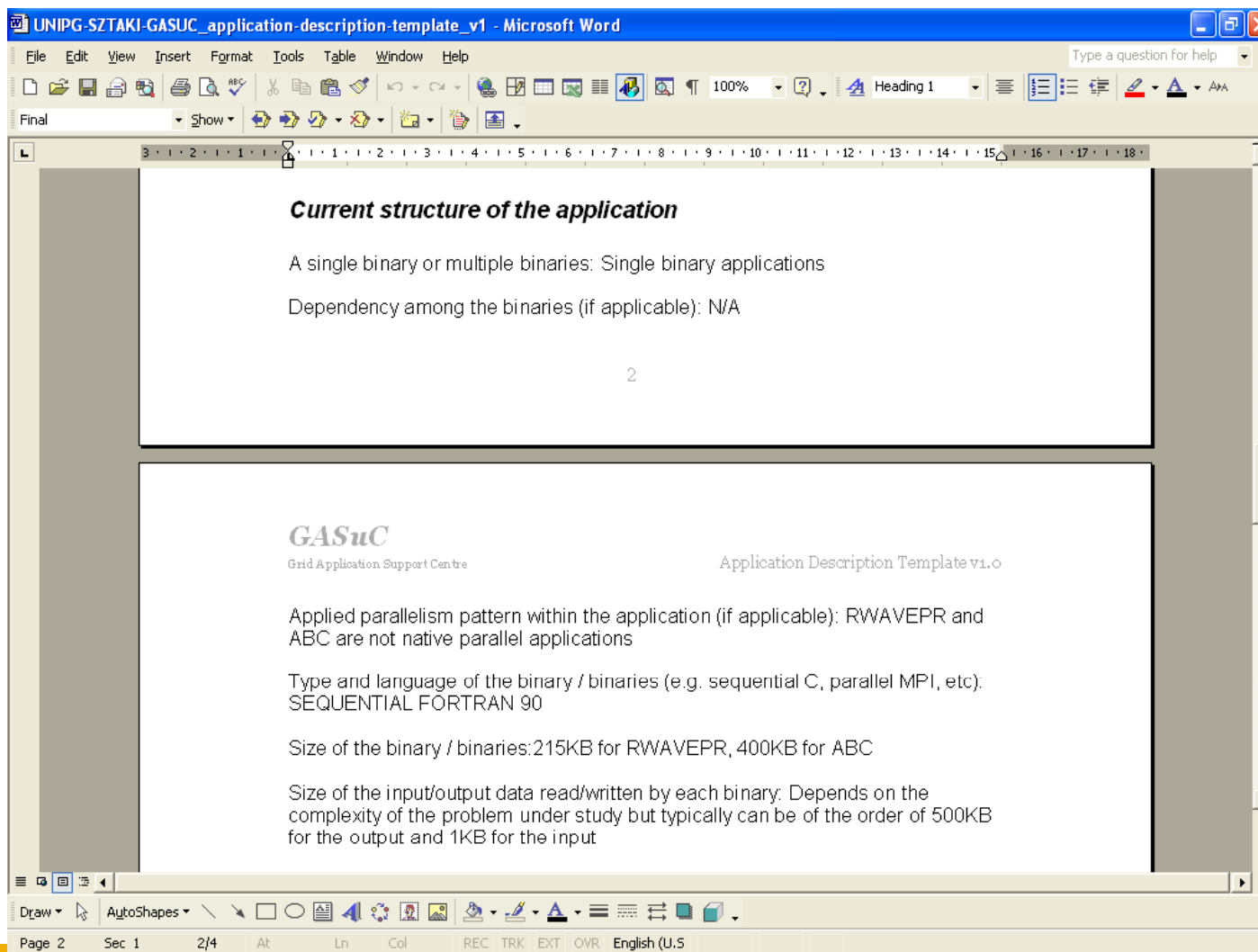
What service do we offer?

Porting legacy applications onto grid infrastructures is usually called "gridification". The **Grid Application Support Centre (GASuC)** provides assistance to current and future grid users and application developers during the application gridification process. GASuC helps identify and apply best patterns, practices, tools and infrastructures in order to get your code running on production grids as soon as possible.

Who are we?

Internet 100%

Application Description Form at www.lpds.sztaki.hu/gasuc



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Feature - Guardian angels at the ready

Life is a complicated, tricky business and we sometimes need a little guidance. In the same way, novice grid users adding their applications to the grid—also a complicated, tricky business—often benefit from a helping hand.

"We are here to be the equivalent of 'guardian angels' for the grid," says Gergely Sipos, porting expert at the [Hungarian Academy of Sciences](#) in Budapest. Sipos is the team leader of a new group within the [Enabling Grids for E-science](#) project. "We want to simplify a process that—in some instances—can be quite difficult."

The [Application Porting Support group](#) is designed specifically to make it easy for new or advanced users to get their applications on the grid closely with application owners to understand their requirements, tools for the porting process and to set up group started their activities this last May as part of EG users.

"Grid application programmers usually feel lost in the presentations that are available on the Web," says Sipos according to our clients' needs and present it to them development effort and increase their efficiency."

Intensive workshops and personalized training events application owners become expert on porting tools that efficiently perform the porting process with the help of

"It is very rewarding for me," Sipos says, "because I can grid and can achieve scientific results that could not be probably without our support."



Image

EGEE NA4

NA4 – SUPPORT FOR EGEE APPLICATIONS

The Enabling Grids for E-science (EGEE) user community runs applications from research domains as diverse as multimedia, finance, archaeology and civil protection. To help the user community take advantage of the benefits of grid computing, EGEE provides a range of support services to its users. A new feature of the project's third phase, EGEE-III, is an Applications Porting Group to help users transfer applications to the EGEE grid.

How it works
Experts from the porting team work closely with application owners to understand their requirements and to identify suitable approaches, tools for the porting process and to set realistic and feasible porting scenarios. Intensive workshops and personalized training events organized by the team ensure that application owners become expert on porting tools and can perform the porting process with the porting team quickly and efficiently.

The support cycle starts with the client completing an "Application Description Template" for the support group. This document reveals the current status of the application, the targeted grid usage scenario and identifies those aspects of the application that may cause difficulties during the porting process.

After the complexity of the porting problem is understood, a porting expert is assigned to the client. The expert's responsibility is to define the roadmap for the porting, to allocate resources, to coordinate the porting process and to ensure that the final application will meet the targeted requirement.

The porting team interact closely with the core middleware developers of EGEE and with the application services developers to stay abreast of the current capabilities of the middleware and third-party services that work well with the EGEE software stack.

Get involved
Any academic or industrial application developer with demands for large number of computational and data storage resources is welcome.

The webpage of the EGEE application porting team is available at www.lids.sztaki.hu/gasuc. Here you can find further information about current applications, past success stories and how to apply.

Group contact
Gergely Sipos (SZTAKI), Technical Coordinator, email: sipos@sztki.hu

Group webpage
<http://www.lids.sztaki.hu/gasuc>

Last updated: 02/09/2008

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GASuC
Grid Application Support Centre

General information home

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Who are we?

[or papers](#)

[ck](#)

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Internet 100%

- **gLite command line tools, scripts, APIs**
 - Interfacing with the middleware services
- **P-GRADE Portal (SZTAKI)**
 - Workflows and parameter studies
 - Application specific interfaces
- **GridWay (UCM)**
 - Metascheduling on clusters and grids
 - Programming abstractions
- **GILDA services (INFN and others)**
 - gLite infrastructure for training and prototyping
 - Training modules and services
- **GEMLCA service (SZTAKI)**
 - Exposing legacy component as Grid services
- **GANGA and DIANE (CERN)**
 - Parameter sweeps
 - Support is provided by external partner



- **Manual**
 - Writing scripts and wrapper programs from scratch
 - Quite often a necessary first step → to test new concepts
 - Often includes new discoveries 😊 and errors ☹ → GGUS
- **Automated porting**
 - Interfacing with gLite/LCG services through high level tools
 - **Ready to use solutions for several typical scenarios**
 - Fault tolerance
 - Handling large number of jobs
 - Composing data-parallel applications → Parameter sweeps
 - Composing task-parallel applications → Workflows

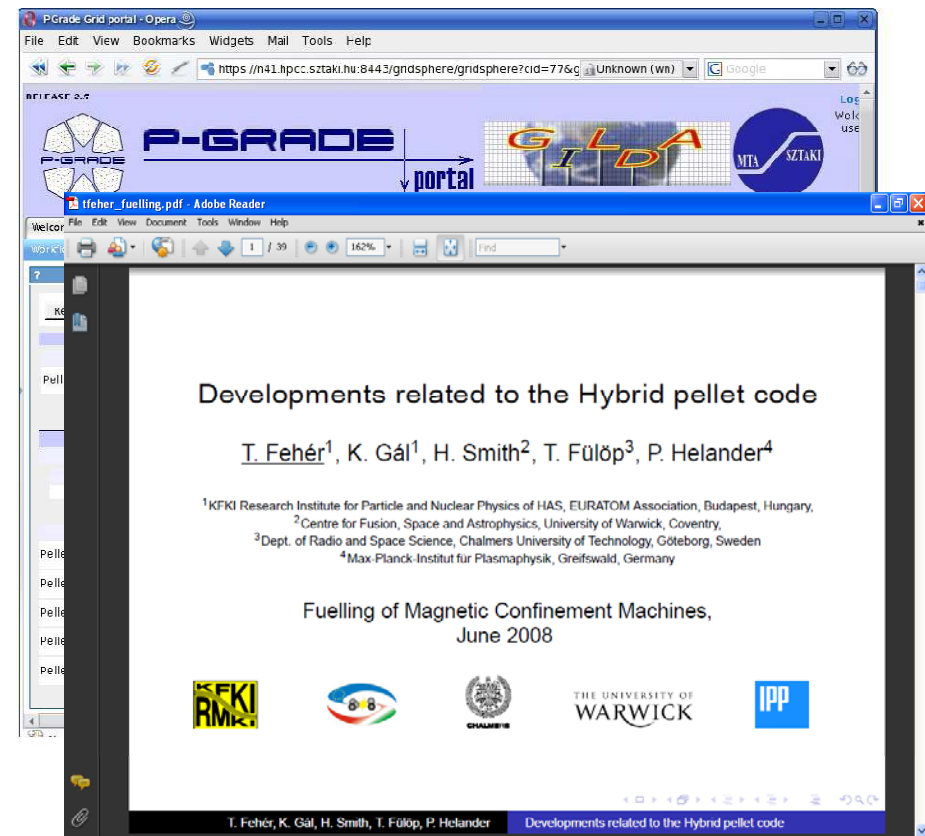
- **Porting for “myself”**

- Demand for large capacity
 - Porting from another grid
 - Coming from a local environment



- **Example**

- Simulate ionized cloud around solid particles shot into plasma (pallets)
- Parameter-study job with P-GRADE Portal, input/output using SE and File catalog
- Few hundred simulations, each running for ~1 hour
- Porting done in a few days
- Output is a presentation and publication at “Fuelling of Magnetic Confinement Machines” conference



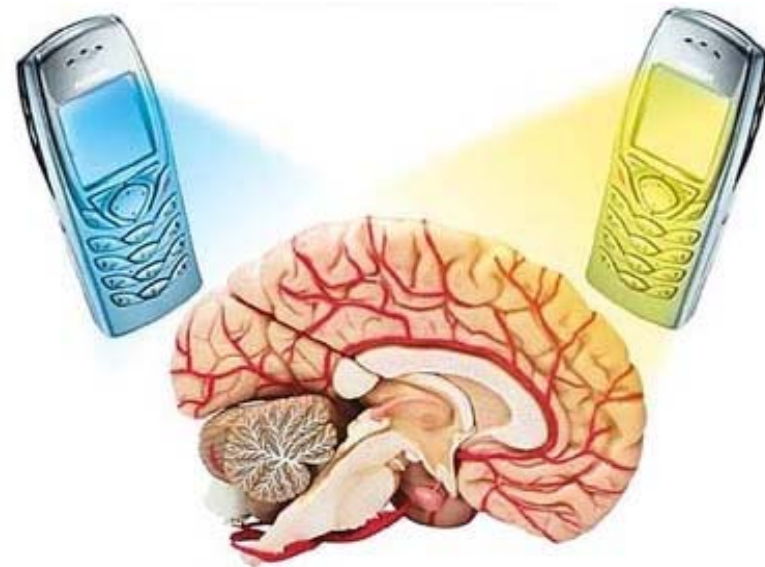
- **Porting and improving for “myself”**

- Demand for large capacity
 - Porting from another grid
 - Coming from a local environment



- **Example**

- Numerical modeling of ElectroMagnetic field distribution in human tissues
- 1-2 mm digital human phantom from MRI data
- Parameter-study execution with scripts
- Current difficulties:
 - MPI program – too few Biomed sites support it
 - Too many files – establishing reliable access to SEs and LFC over long time

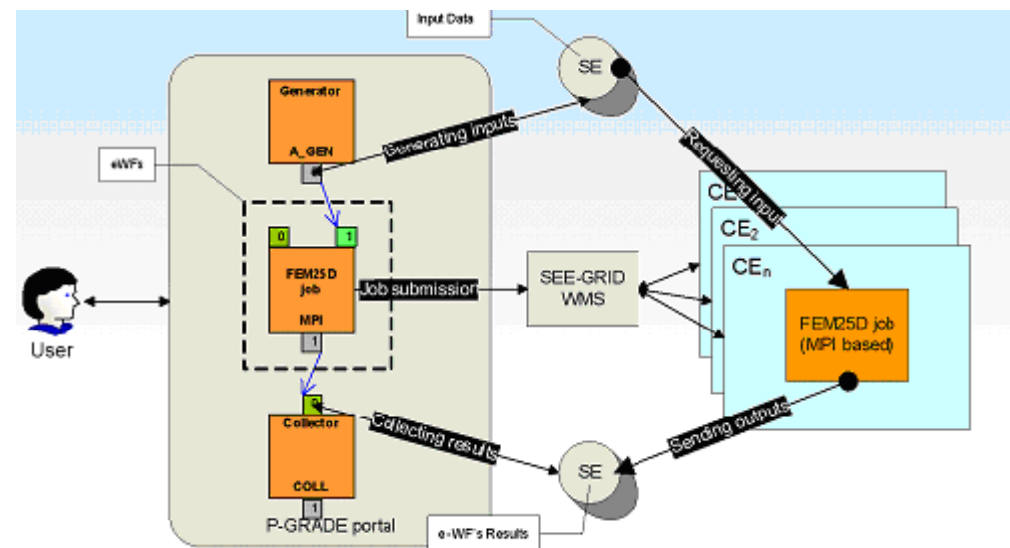


Typical goals of porting 2.

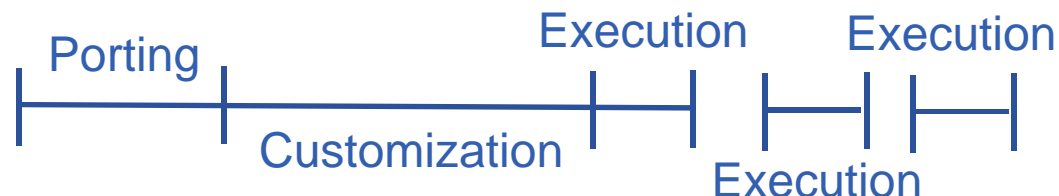
- **Porting for my group/VO/project**
 - Customized (G)UIs are often required
 - Typically motivated by a grid project



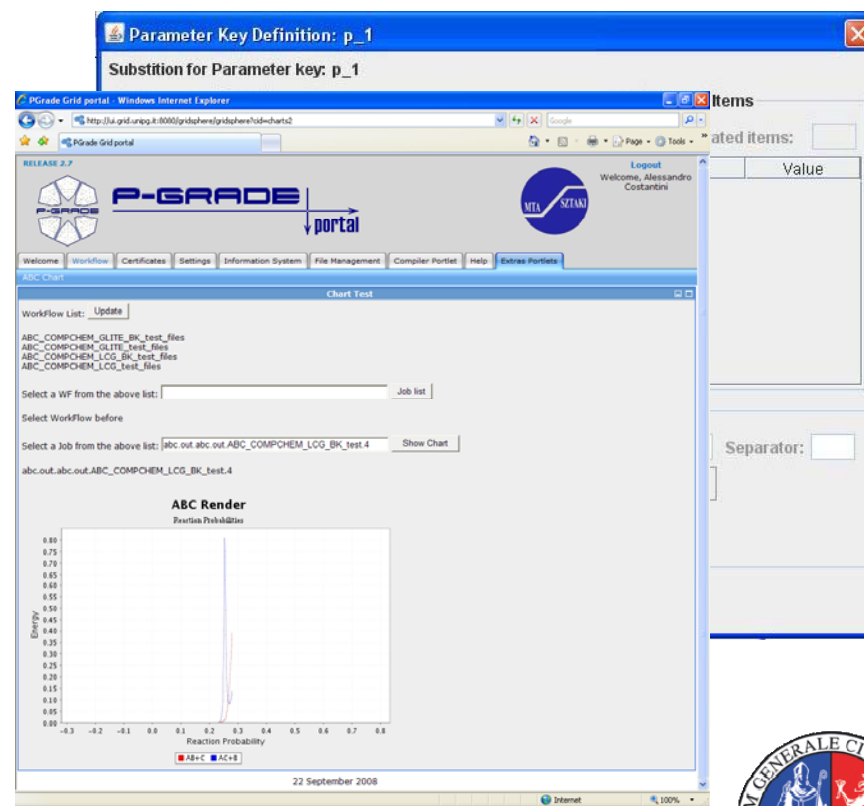
- **Example**
 - Dimensional Frequency Domain Electromagnetic Numerical Modeling
 - Geoinformatics, metallurgy
 - Parameter study workflow in P-GRADE



- **Porting to operate grid application as a service**
 - Application developer is not the end user
 - End users are already known
 - They are typically non-IT people



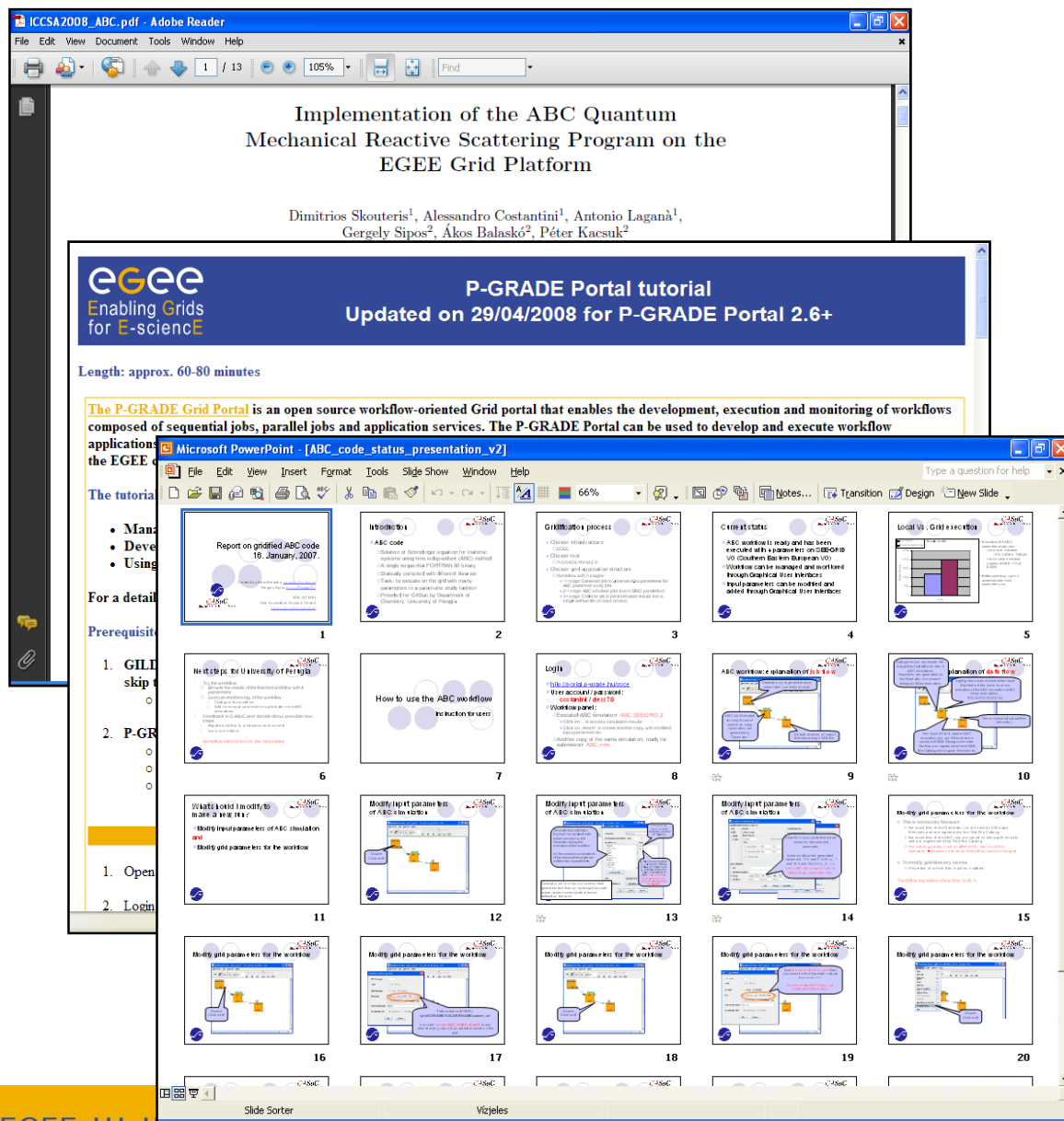
- **Example**
 - Solution of Schrodinger equations for triatomic systems
 - Parameter study based on Fortran90 code
 - Data size is manageable
 - Application ported with P-GRADE in ~2 weeks (incl. consultancy!)
 - Custom interface developed by application owner



- **Collaborating with NA3 Training activity on porting courses and schools:**
 - First part is dedicated to learn the basics of gLite and high level tools
 - Second part is dedicated to application porting
 - Working in groups
 - Reporting, regular presentations
 - Concept piloted by INFN and adapted since by SZTAKI and others
 - Next event at Paris Observatory in December

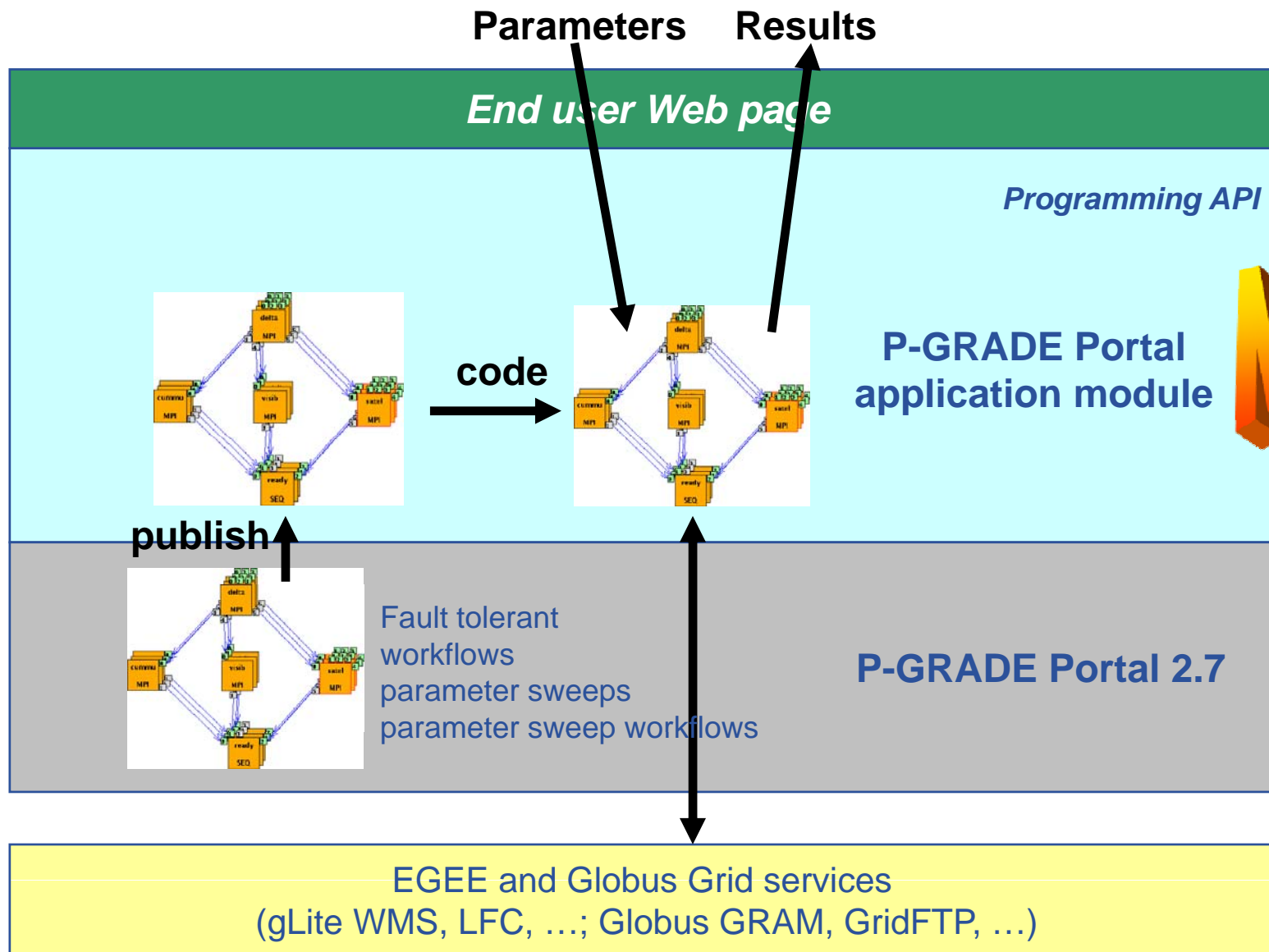


- Conference papers
- Tutorials, training materials
- Case studies



The image shows a composite screenshot of a presentation. At the top, a PDF viewer displays a conference paper titled "Implementation of the ABC Quantum Mechanical Reactive Scattering Program on the EGEE Grid Platform" by Dimitrios Skouteris¹, Alessandro Costantini¹, Antonio Laganà¹, Gergely Sipos², Ákos Balaskó², and Péter Kacsuk². Below this, a Microsoft PowerPoint window displays a tutorial titled "P-GRADE Portal tutorial Updated on 29/04/2008 for P-GRADE Portal 2.6+". The tutorial includes a description: "The P-GRADE Grid Portal is an open source workflow-oriented Grid portal that enables the development, execution and monitoring of workflows composed of sequential jobs, parallel jobs and application services. The P-GRADE Portal can be used to develop and execute workflow applications on the EGEE Grid." The main content of the tutorial is a grid of 20 numbered slides, each with a thumbnail and a title, such as "Report on gridified ABC code 10 January 2007", "Introduction", "Gridification process", "Grid status", "Local vs. Grid execution", "How to use the ABC workflow", "Log in", "ABC workflow: a visualization of the ABC workflow", "Modification of ABC workflow", "What's new in our new ABC workflow?", "Modify input parameters of ABC simulation", "Modify grid parameters for the workflow", and "Modify grid parameters for the workflow" (slides 16-20).

Develop an application specific grid portal



New



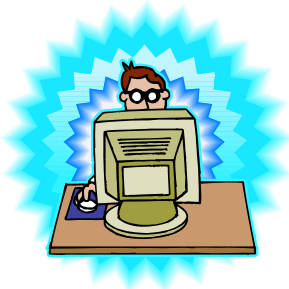
Portal Administrator

- Installs P-GRADE Portal 2.7



Grid Application Developer

- Port application to grid with P-GRADE:
 - Job, workflow, parameter study or combination of these
 - No need to modify your code



Grid Portal Developer

- Develops a Web page for end users
- Installs and configures Application Module to P-GRADE
- Registers P-GRADE application in application module



End Users

- Executes the published application with custom input parameters
- Benefits from fast execution and richer result

If you have an application but

- you do not know EGEE
- you face any difficulty with gLite
- do not know what is available “out there”
- work for an external project that involves porting code to EGEE

apply for assistance: www.lpds.sztaki.hu/gasuc

Visit a porting support centre

- EGEE can provide financial support for your visit
- **Porting is an efficient way to**
 - Extend the user community
 - Represent user communities
 - Transfer knowledge between various groups

EGEE Application Porting Support Group

www.lpds.sztaki.hu/gasuc

Questions?