



***EnginFrame Portal and SGE***  
***= High Productivity Computing***

Andrea Rodolico, CTO  
e-mail: [info@nice-software.com](mailto:info@nice-software.com)



# Contents

- About us
- A portal for the Grid-enabled applications
- Key features
- Customer stories

# NICE Background



- Expertise in HPC / Grid deployment
  - 11 years experience with enterprise Grid solutions throughout all industries
  - Strong relationship with Research and Academia
- Core business: Access to Grid / HPC solutions
  - EnginFrame & GENIUS Grid Portal product line
  - Integration with global ISVs
- Other relevant competencies
  - Server-based computing
  - Grid Intelligence



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# What issues are addressed

- **Complex IT infrastructure**
  - Difficult to optimally leverage resources
  - Different programs, applications, GUIs, OS, SAN, SOA
- **Data management and security**
  - Timely, consistent, transparent data access
  - Controlled access for IP protection
- **Teamworking and collaboration**
  - Complex, slow, ad-hoc collaboration
  - Identity management
- **New business opportunities**
  - ASP, compute-on-demand, HPC consolidation
  - Experience sharing and leveraging

# Who uses EnginFrame?

- Automotive
  - Audi, ARRK, Bosch, Bridgestone, Delphi, Elasis/CRF, FIAT Auto, Ferrari, GDX Automotive, Honda, Magneti Marelli, McLaren, P+Z, Suzuki, Swagelok, Toyota, TRW
- Aerospace and Manufacturing
  - AIRBUS, Air Products and Chemicals, Procter&Gamble, Galileo Avionica, Magellan Aerospace, Raytheon, Hamilton Sunstrand, Kimberly Clarke, MTU, Northrop Grumman
- Energy
  - Addax Petroleum, AECL, British Gas, Chevron, Conoco-Phillips, ENI, Hess, Nexen, Rosneft, Schlumberger, Slavneft, Statoil, TiumenNIIgaz, TNK/BP, TOTAL, Gazprom/VNIIgaz
- Electronics
  - STMicroelectronics, Accent, SensorDynamics, Motorola
- Others
  - Telecom Italia, CC of Water Resources, M.D.Anderson, Biolab, SIB
- Research
  - ASSC, CCLRC, CERN, CILEA, CINECA, CNR, CNRS/IN2P3, DEISA, ENEA, FzU, ICI, IFAE, INFN, ITEP, JSC G.G.M., KU Leuven, SSC-Russia, SDSC
- Education
  - Ferrara University, ITU, Georgia State University, Messina University, Politecnico of Milan, Technische Universität Dresden, Trinity College Dublin, Salerno University, Huazhong Normal University

# How do our customers use EnginFrame?

Enterprise Grid

Desktop Scavenging

HPC App. Portal

HPC Clusters

Open Grid ASP

Commercial HPC ASP

HPC SaaS

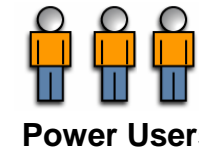
Collaborative design

Visualization farm

# The Grid as Computational SOI



Partners



Power Users



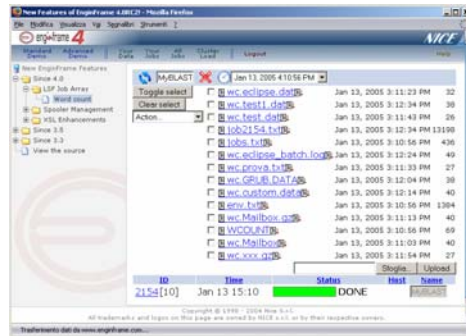
Internal Users



External Users



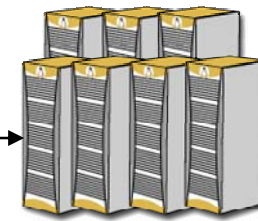
Standard protocols



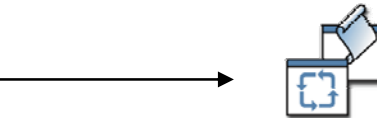
EnginFrame  
Application  
Portal



Enterprise /  
JSR168 Portals



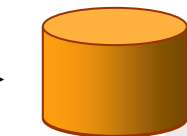
Sun GridEngine



Licenses

Batch  
Applications

Interactive  
Applications



Data Storage





# Which applications are used in EnginFrame?



# Benefits for the Engineering

- **Evolutionary deployment**
  - Preserve all investments in scripting
  - Painless roll-out side-by-side with terminal or remote desktop
  - Handles complexity preserving user-friendly approach
- **Integrated with ISVs and mainstream middleware**
  - Transparent data management capabilities
  - Reduce errors and misuse of the Grid / applications
  - Cut training costs and improve users' productivity
- **Integrated with workflow engines**
  - Accelerate supply chain collaboration
  - Bottom-up and top-down engineering process automation
  - Standardize and enrich data management

# Benefits for the IT manager

## ■ **Reduced costs**

- Menu-based, intuitive, application-centric interface
- Broaden and maximizes the exploitation of the IT infrastructure
- Lower client TCO

## ■ **Reduced risks**

- Evolves with your IT infrastructure and Grid
- Align with company's IT security policies
- Controlled access to data and information

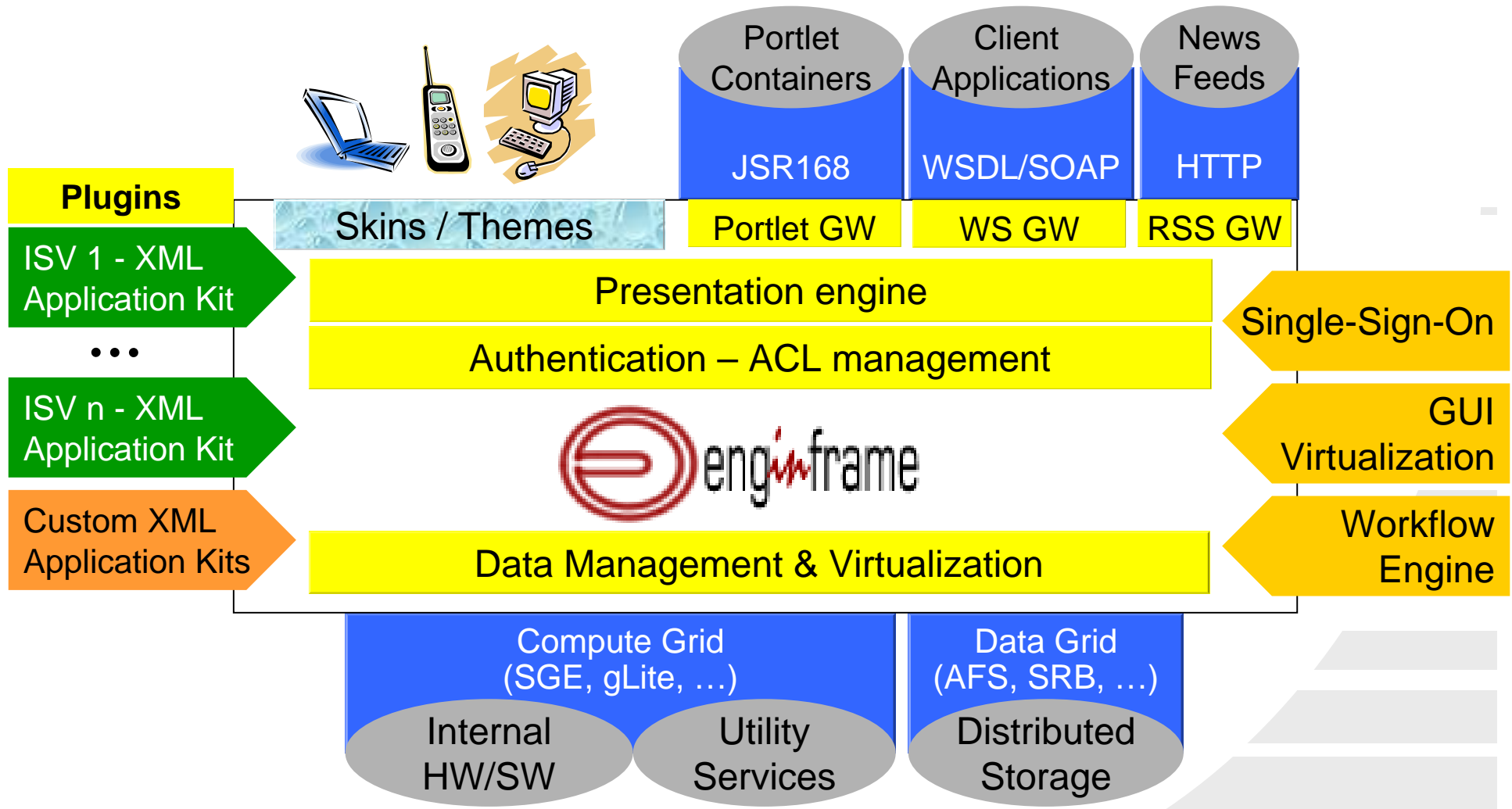
## ■ **Exploitation of Server Consolidation/Virtualization**

- Black-box, application-level virtualization
- One-stop-shop for computing, visualization, data
- Only one customization for multiple access media / patterns

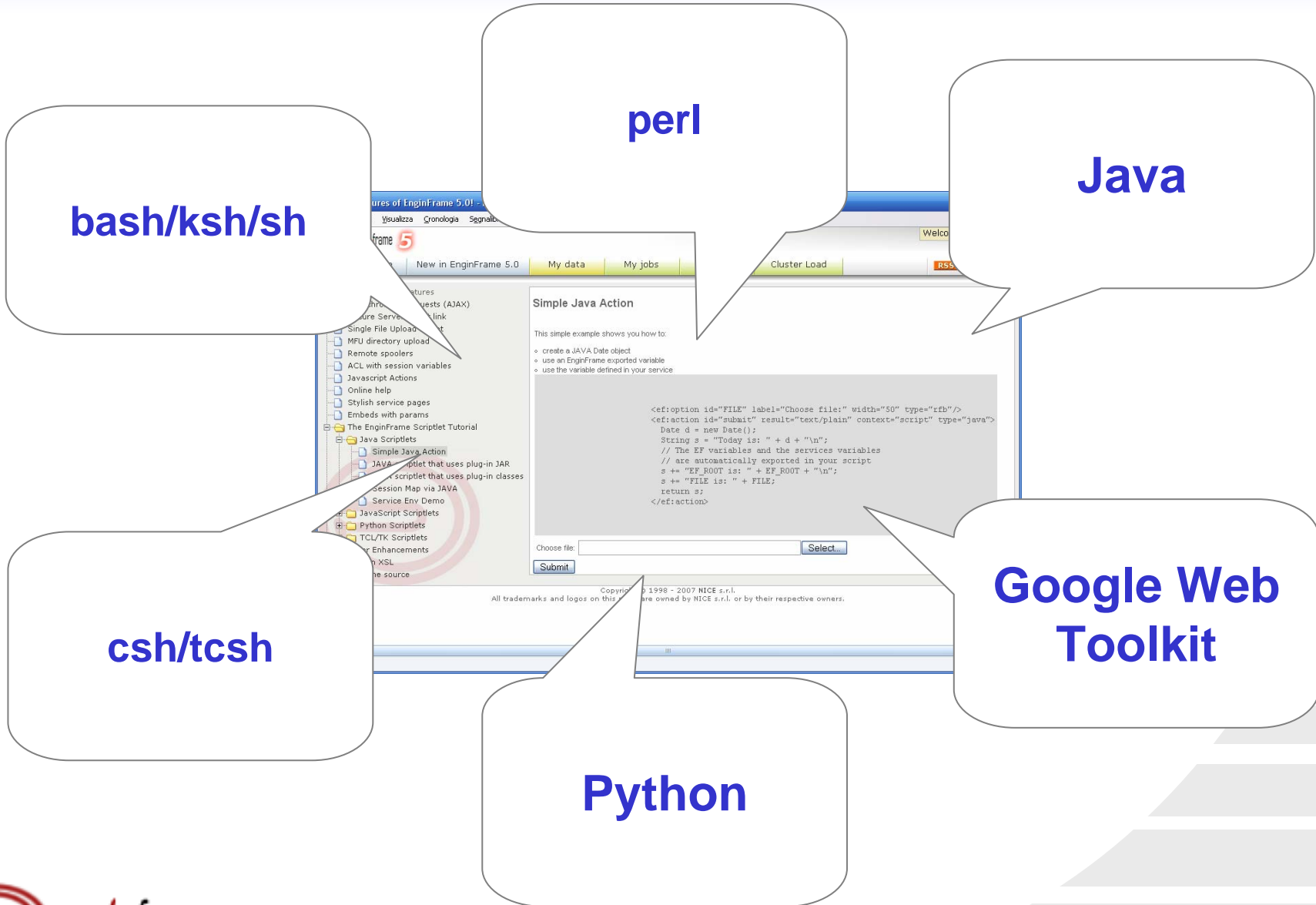
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# EnginFrame at a glance



# Multi-language scripting



# User-friendly job submission

*User friendly,  
Application-oriented  
Job submission*

*Flexible and efficient  
Input file management*

*Hide complexity of  
Underlying scheduler*

The screenshot shows the Gridage 4.1 web interface in a Mozilla Firefox browser. The page title is "Gridage - Mozilla Firefox" and the URL is "http://www.gridage.com/engineframe/gridage/main/gridage.xml?\_folder=rt". The interface features a navigation menu with "my jobs", "all jobs", and "cluster load" tabs, along with "RSS" and "logout" buttons. A sidebar on the left lists "Grid Services" including MSC.Nastran, MSC.Marc, MSC.Actran, MSC.ADAMS, MSC.Dytran, MSC.PThermal, MSC.Patran, and Radioss. The main content area is titled "MSC.Nastran" and contains a form for job submission. The form includes fields for "Project:" (Project1), "Label:" (NASTRAN), "Nastran version:" (Nastran 2005 R2), "Remote input file:" (with a "Select..." button), "Input file (.dat or .zip):" (with an "Sfoggia..." button), "No. of CPU:" (1), "Keep files on compunode:" (no), "Additional options:" (empty), "Estimated elapsed time:" (Select one...), "Estimated memory requirements:" (Select one...), "Estimated disk space:" (Select one...), "Notify by mail:" (checkbox), "When job starts:" (checkbox), and "When job finishes:" (checkbox). A "Submit job" button is at the bottom. The footer of the page includes "Completato" and "Copyright © 1988 - 2005 NICE S.r.l. - Gridage version 4.1".

# SOA-enabled job submission

```
C:\WINDOWS\system32\cmd.exe
EFClient [--conf <conf>] --id <id> [-v|--version] [-h|--help] --input <input>
--mem <mem> --scr <scr> --addpars <addpars>

Submit a Nastran service.

[--conf <conf>]
  The client configuration file (default: ${user.home}/.efclient.conf).

--id <id>
  The ID of the EnginFrame service.

[-v|--version]
  Prints version information and exit.

[-h|--help]
  Prints this help message.

--input <input>
  Input File

--mem <mem>
  Memory
  Valid values:
  - 1GB
  - 2GB
  - 4GB
  <default: 2GB>

--scr <scr>
  Scratch
  Valid values:
  - 10GB
  - 20GB
  - 30GB
  <default: 20GB>

--addpars <addpars>
  Additional Parameters:

C:\EFClient\Windows>
```

- WS-I interface
- Java client library and command line interface
- Simplifies integration with client-side applications (optimization, workflow, etc.) for power-users

Motors - Mozilla Firefox

Segnalibri Strumenti ?

Blog di Beppe Grillo WebChanges < Proje... Google Calendar Gridage

### Nastran

**Info**  
This is a demo page to submit NASTRAN using Web Services

Input File  Sfoglia...

Memory  ▼

Scratch  ▼

Additional Parameters:

Completato



# Monitoring & control

**Global Job monitoring**

**Cluster & host monitoring**

| Grid Services | ID    | Project | Time         | Status |
|---------------|-------|---------|--------------|--------|
| MSC.Marc      | 23065 | Tr3Df5  | Mar 16 10:07 | EXIT   |
| MSC.Actran    | 23066 | Tr3Df5  | Mar 16 10:09 | EXIT   |
| MSC.ADAMS     | 23007 | Tr2Df3  | Mar 14 14:49 | EXIT   |
| MSC.Dytran    | 22998 | Tr12Df2 | Mar 14 12:48 | DONE   |
| MSC.PThermal  | 22806 | TEST    | Mar 9 18:16  | DONE   |
| MSC.Patran    | 22807 | TEST    | Mar 9 18:26  | DONE   |
| Radioss       | 23018 | test    | Mar 14 17:34 | EXIT   |
|               | 23020 | test    | Mar 14 17:48 | EXIT   |
|               | 23023 | test    | Mar 14 17:57 | DONE   |
|               | 23024 | test    | Mar 14 17:59 | DONE   |
|               | 23025 | test    | Mar 14 18:00 | EXIT   |
|               | 23027 | test    | Mar 14 18:12 | DONE   |
|               | 23028 | test    | Mar 14 18:13 | DONE   |
|               | 23030 | test    | Mar 14 18:20 | DONE   |
|               | 23031 | test    | Mar 14 18:22 | DONE   |
|               | 23032 | test    | Mar 14 18:24 | DONE   |
|               | 23033 | test    | Mar 14 18:25 | DONE   |
|               | 23034 | test    | Mar 14 19:33 | DONE   |

**Job details & control**

**Host gridage2**

Status: ok

Hardware:

- Host type: HPPA11
- Host model: Intel\_IA64
- Number of processors: 2
- Physical memory: 8181M
- Swap space: 4096M

Load:

- Number of users: 0
- CPU utilization: 50 %
- CPU run queue length:
  - Averaged over 15 sec: 2.0
  - Averaged over 1 min: 2.0
  - Averaged over 15 min: 2.1
- Available physical memory: 6872M / 8181M
- Available swap space: 3910M / 4096M
- Free space in /tmp: 2452M
- Paging rate: 1.0 pages/sec
- I/O throughput: 108 Kb/sec
- Idle time: 2932 min

| ID    | Project  | Time         | Status | Host     | Name                 |
|-------|----------|--------------|--------|----------|----------------------|
| 23068 | Project1 | Mar 16 11:21 | RUN    | gridage2 | M_maniglia_10381.job |

Details Resource usage: CPU: 18145s. Memory: 426 Mbytes Swap: 439 Mbytes;

# Output management

*Data lifecycle management*

*Comprehensive output File manipulation (view, edit, delete, zip, ...)*

*Follow-up actions support*

Gridage - Mozilla Firefox  
http://www.gridage.com/engineframe/gridage/main/gridage.xml?\_uri=//cor

my jobs all jobs cluster load RSS logout

22953 - NASTRAN - Project1 Mar 18, 2006 11:14:12

|                          |                     |                       |             |
|--------------------------|---------------------|-----------------------|-------------|
| <input type="checkbox"/> | 1e2x10.dat          | Mar 13, 2006 11:14:20 | 5057 bytes  |
| <input type="checkbox"/> | N_NASTRAN_28073.job | Mar 13, 2006 11:14:21 | 3949 bytes  |
| <input type="checkbox"/> | INFO_22953.txt      | Mar 13, 2006 11:14:21 | 130 bytes   |
| <input type="checkbox"/> | 1e2x10.f04          | Mar 13, 2006 11:14:20 | 5985 bytes  |
| <input type="checkbox"/> | 1e2x10.f06          | Mar 13, 2006 11:14:21 | 15806 bytes |
| <input type="checkbox"/> | 1e2x10.log          | Mar 13, 2006 11:14:21 | 3584 bytes  |
| <input type="checkbox"/> | post_processing.ses | Mar 13, 2006 11:14:21 | 254 bytes   |

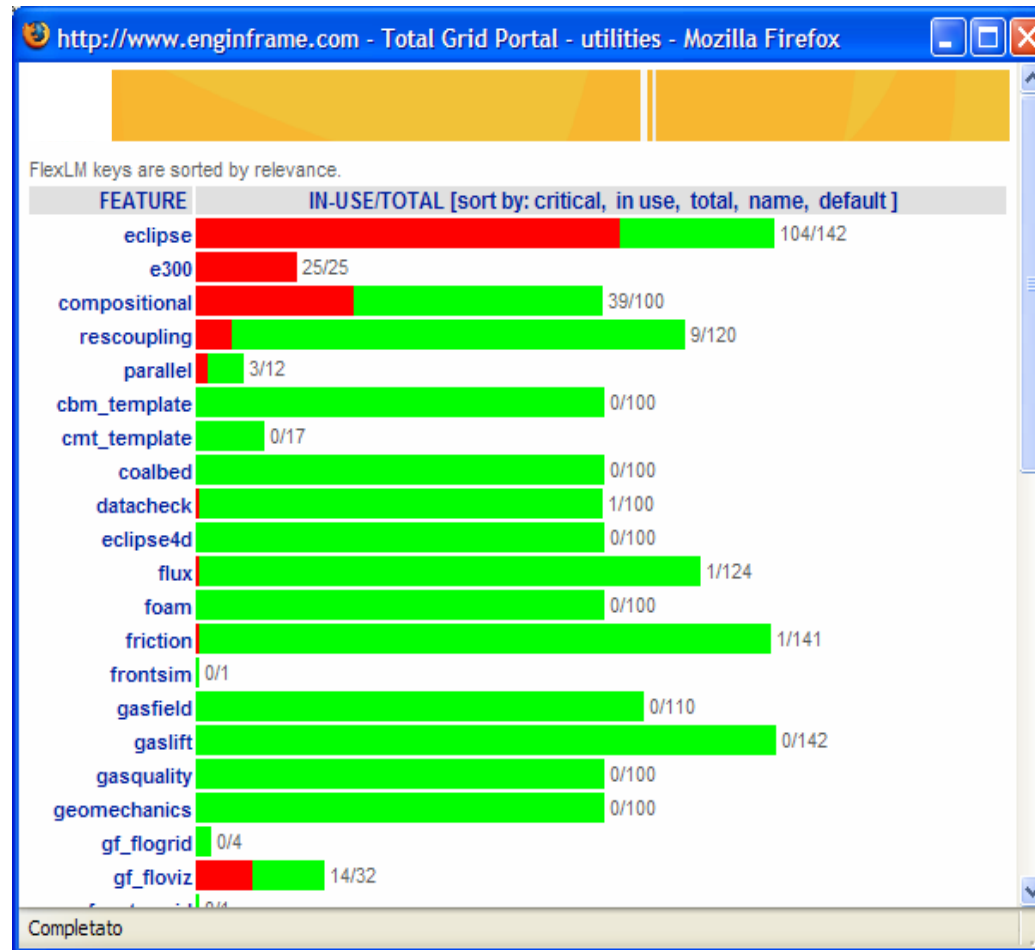
Resubmit Nastran

| ID    | Project  | Time         | Status | Host       | Name                |
|-------|----------|--------------|--------|------------|---------------------|
| 22953 | Project1 | Mar 13 11:14 | DONE   | intelmuc06 | N_NASTRAN_28073.job |

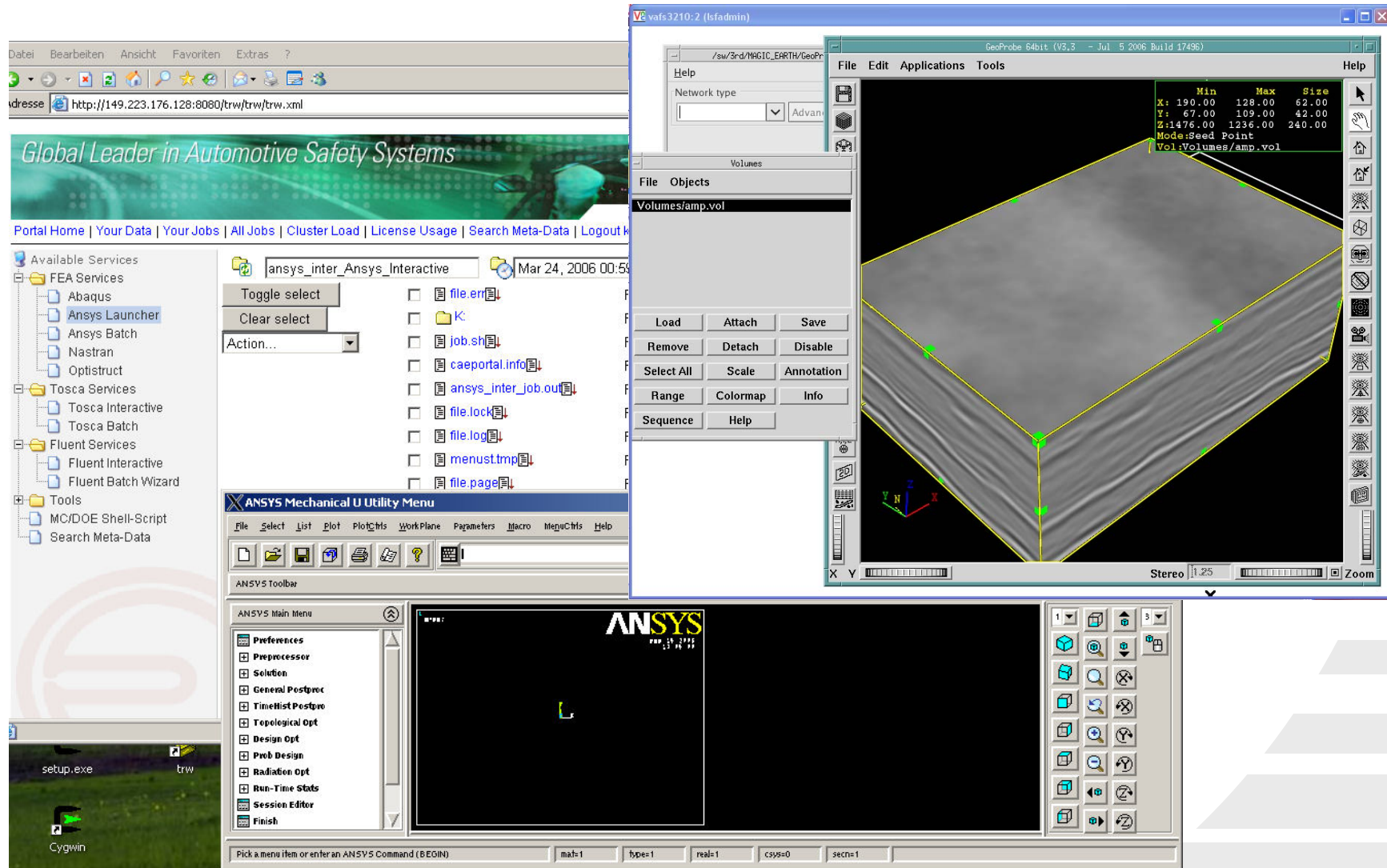
Resource usage: CPU: 0.4s.

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# FLEXIm License monitoring



# Seamless Interactive Application Integration





# Enterprise / JSR168 Portal integration

The image shows a screenshot of a web browser displaying two overlapping windows. The background window is the 'Design Centre' interface, which includes a user profile section with the following details:

- User Name: callcorr
- User ID: A1000405
- Project Name: Test\_pr\_1
- Project ID: 190205
- External ID: my\_externalid
- Phase: Software Requirement Analysis

The Design Centre also features a 'Design Tools' section with various tool icons and links, such as 'Statemate [Wrp] SunOS 3.1', 'Doors 6.0 [Wrp]', 'adamulti [Wrp] SunOS 3.0', 'Board Architect', 'Design Architect', 'modelsim [Wrp] SunOS 5.6', 'FPGA Advantage', 'HDL Designer Seri 2002.1b', 'Unix FileManager [Wrp] SunOS 1.0', 'Microsoft Word', 'Windows FileManager [Wrp] Windows2000 1.0', 'Microsoft Excell', 'Xterm [Wrp] SunOS 1.0', and 'Command Prompt [Wrp] Windows2000 1.0'.

The foreground window is the 'GENIUSphere Portal' (Mozilla browser). It displays a 'Welcome to GENIUSphere Portal' message with logos for INFN, egee, GENIUS, enginframe, and NICE. The main content area is titled 'List Available Resources' and contains the following text:

Please, select a JDL file in order to get the list of Computing Elements that match your job requirements.

JDL File

The 'Job Submission' section contains:

Please, select a JDL file to submit. You may also choose a Resource Broker to connect to.

JDL File

The 'Job Queue' section displays the message: 'Sorry, Your Job Queue is empty.'

The 'List your spoolers' section is currently empty.

On the right side of the portal window, there is a file explorer showing a directory listing of JDL files:

| File Name                     | Permissions     |
|-------------------------------|-----------------|
| DAG.jdl                       | 566 -rw-rw-r--  |
| DMX.jdl                       | 522 -rw-rw-r--  |
| EtnaPerGRID.jdl               | 1740 -rw-rw-r-- |
| ExampleN01.jdl                | 559 -rw-rw-r--  |
| MessageToSpheres.jdl          | 1964 -rw-rw-r-- |
| Text2Midi.jdl                 | 1611 -rw-rw-r-- |
| example2.jdl                  | 257 -rw-rw-r--  |
| hadrontherapy.jdl             | 616 -rw-rw-r--  |
| helloworld.jdl                | 792 -rw-rw-r--  |
| hostname.jdl                  | 203 -rwxrwx---  |
| hostname_catania.jdl          | 249 -rw-rw-r--  |
| hostname_glite.jdl            | 231 -rw-rw-r--  |
| interactive.jdl               | 193 -rw-rw-r--  |
| jdl_test.jdl                  | 585 -rwxr-xr-x  |
| job-requesting-data-glite.jdl | 465 -rw-rw-r--  |
| myInputDataFireman.jdl        | 422 -rw-rw-r--  |
| scriptBrokerInfo.jdl          | 235 -rw-rw-r--  |

At the bottom of the portal window, there is a 'Path' field containing '/home/falzone' and a 'Selected:' field.

# Data exchange, sharing and versioning

File Transfer Portal - Mozilla Firefox

https://e-gates.accent.it/datagate/dg.xml?\_uri=//dg/show\_dataset

La Repubblica.it » H... NICE . Projects . We... Euro to U.S. Dollar E... Bugzilla Main Page LSF Jobs

ACCENT

File Transfer Services

- WAGO tools
- Manage Users
- Manage Projects
- Manage Datasets
- Choose Projects

Account: efadmin  
DataGate Administrator - datagate

Inbox (Admin V)

| To | Files                               | Date                     | Subject            |
|----|-------------------------------------|--------------------------|--------------------|
|    | <input checked="" type="checkbox"/> | 2005/11/08/ 18:16:47 CET | Test for BCM27     |
|    | <input checked="" type="checkbox"/> | 2005/11/10/ 16:31:15 CET | XIP typo fixed f   |
|    | <input checked="" type="checkbox"/> | 2005/11/10/ 17:27:52 CET | Abstracts          |
|    | <input checked="" type="checkbox"/> | 2005/11/11/ 11:09:59 CET | Correct update     |
|    | <input checked="" type="checkbox"/> | 2005/11/11/ 17:35:59 CET | Abstract dei DC    |
|    | <input checked="" type="checkbox"/> | 2005/11/11/ 17:43:02 CET | Libreria prelimina |
|    | <input checked="" type="checkbox"/> | 2005/11/14/ 12:03:27 CET | modello VHDL       |
|    | <input checked="" type="checkbox"/> | 2005/11/14/ 16:07:12 CET | First Netlist (RE  |
|    | <input checked="" type="checkbox"/> | 2005/11/14/ 18:10:57 CET | Mapped Conting     |

Completato

SensorDynamics CVS Portal - Microsoft Internet Explorer

sensor dynamics

Directory [ /home/mdm/tmp/prova\_PDK ] analysis:

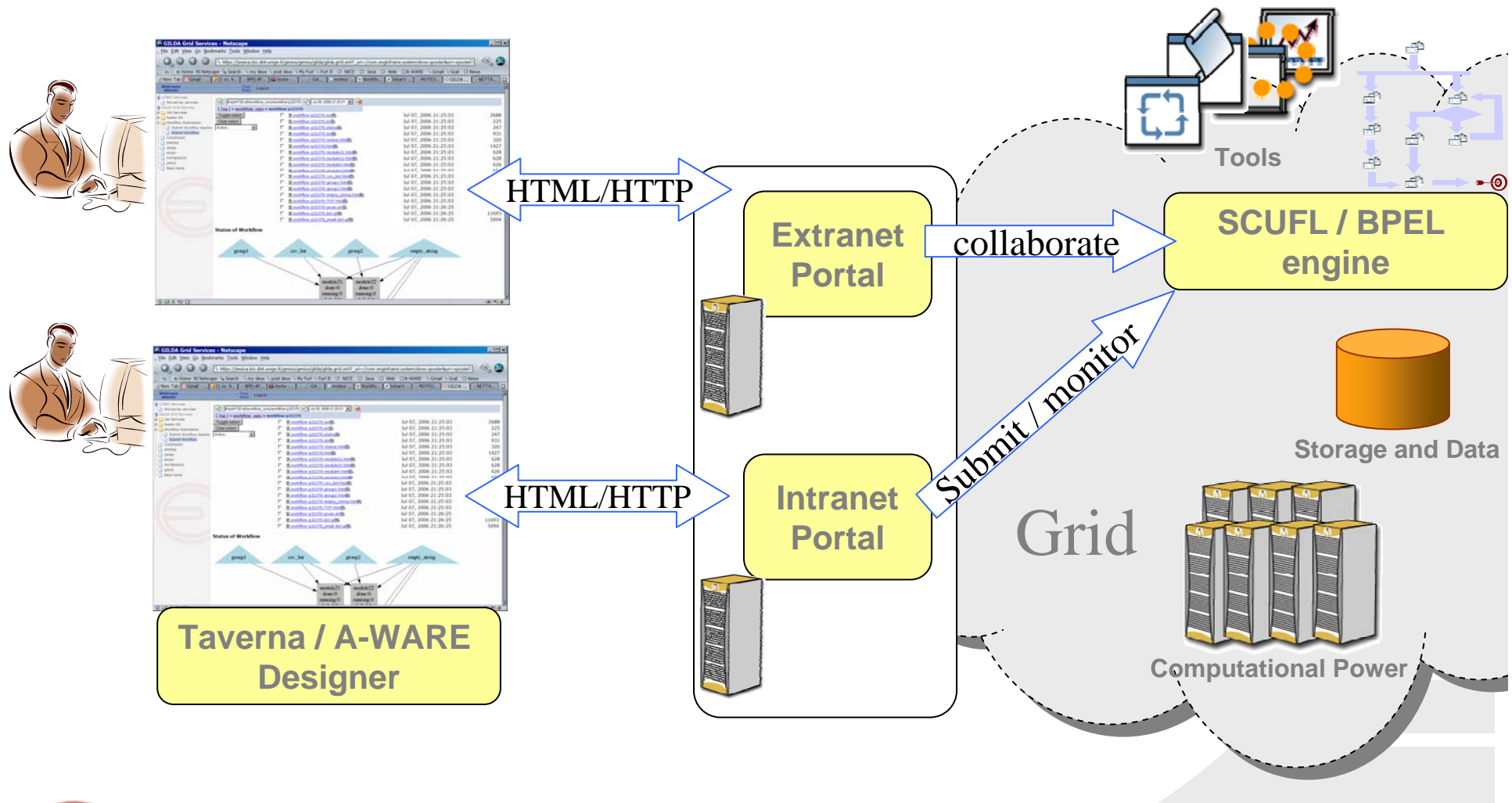
| Folders Processed | Items Processed | Folders Displayed | Items Displayed  |
|-------------------|-----------------|-------------------|------------------|
| 106               | 43              | 106               | 45               |
| Up to Date        | Unknown Items   | Needs Patch       | Locally Modified |
| 39                | 2               | 1                 | 1                |
| Added Locally     | Removed Locally | Conflict Items    | Need Checkout    |
| 0                 | 0               | 1                 | 1                |

Directory [ /home/mdm/tmp/prova\_PDK ] details:

| Folder:                              | Status            | Revision | Date         |
|--------------------------------------|-------------------|----------|--------------|
| dependencies.lst                     | Up to Date        | 1.1      | May 30 15:59 |
| IP_import                            |                   |          |              |
| prova.cfg                            | Unknown File      |          | Jun 26 20:56 |
| IP_customized                        |                   |          |              |
| cds_import.lib                       | Up to Date        | 1.1      | Jun 26 20:55 |
| admin                                |                   |          |              |
| cleanlibs.csh                        | Locally Modified  | 1.1      | Jul 8 08:12  |
| cleanlibs_all.csh                    | Needs Patch       | 1.2      | Jun 26 20:55 |
| compile.tcl                          | WARNING Conflict! | 1.2      | Jul 8 08:34  |
| read_vhdl.tcl                        | Up to Date        | 1.1      | May 30 15:59 |
| set_libs.tcl                         | Need Checkout     | 1.1      |              |
| imp/asic/tsmc_035_p/FE/ambit/sdf     |                   |          |              |
| imp/asic/tsmc_035_p/FE/ambit/verilog |                   |          |              |

http://10.1.3.11:8080/sensordynamics/sd\_cvs.xml?\_uri=//com.sensordynamics.cvs/cvs\_change\_dir&SD\_CVS\_DIR=/hi

# Workflow integration



## Highlights of EnginFrame 5.0

- Support for **Windows** as a **hosting** (WS2K3R264B) & **computing** platform (CCS)
- **Java-based scripting** support for service development
- **Web 2.0** enhancements
  - AJAX based services for rich user interaction
  - Google Web Toolkit integration for rich UI design
- Transparent **multiple remote data storage** management
- **Security** improvements
  - Encrypted agent-server connection
  - Context-sensitive extensions for the authorization system
- **Administration** improvements
  - New graphical installer
  - Simplified plug-in installation and life cycle management

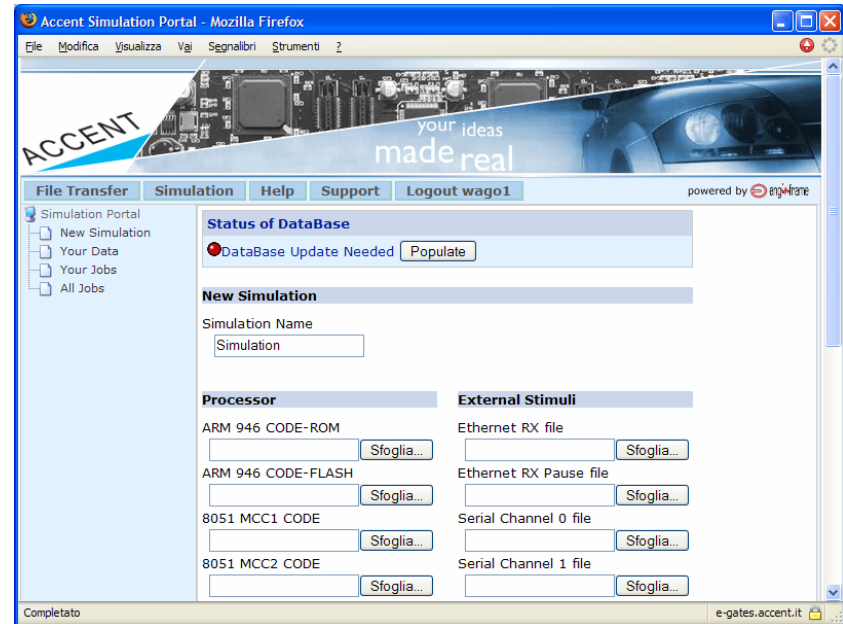


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# Case Study: Accent

- **Market**
  - Electronics
- **Value proposition**
  - Collaboration infrastructure for EDA projects
- **Before the project**
  - FTP / mail data exchange
  - Testing performed scheduling human meetings
  - Training / mentoring overhead
  - Weak IP protection policies
- **Solution**
  - NICE EnginFrame
  - NICE DataGate
  - Sun computing infrastructure



- **Benefits**
  - From concept to production in 2 weeks
  - Easier project tracking
  - Up to 15% speed up of projects in critical testing / acceptance phases
  - Better customer experience

# Case study: DEISA

- **Market**
  - Gov & Life Sciences
- **Value proposition**
  - User-friendly portal for the Life Science user community (VO)
- **Context**
  - TeraGrid-like funded project
  - 2° largest European Grid
  - Connects the 11 largest HPC centers in Europe
  - Complex security policies
  - Multiple schedulers
- **Solution**
  - NICE EnginFrame
  - NICE DataGate
  - Custom enhancements (will be included in v5.x)

The screenshot shows a web browser window titled "DEISA Life Sciences Portal - Mozilla Firefox". The page header includes the DEISA logo, "DISTRIBUTED EUROPEAN INFRASTRUCTURE FOR SUPERCOMPUTING APPLICATIONS", and logos for EnginFrame, NICE, and the European Union. A navigation bar contains links for Home, Your Jobs, Cluster Load, Spoolers, and Logout. The main content area is titled "RAxML" and contains a form for submitting RAxML jobs. The form includes fields for RAxML job name, sequence file name, output file name, and substitution model. It also has dropdown menus for selecting a substitution model and a radio button for the number of categories (set to 50). Other options include "Completely random starting tree" (radio buttons for yes/no), "Algorithm" (radio buttons for rapid hill-climbing, optimize tree, and bipartitions onto a single tree), "Number of bootstrap replicates" (text input), "Random number seed for bootstrapping" (text input), "Weight file name" (text input), "How long to optimize" (text input), "Multi-furcating constraint file" (text input), "Binary constraint file" (text input), "Initial rearrangements" (text input), "Write intermediate trees" (radio buttons for yes/no), and "Multiple model file" (text input). Each text input field has a "Stoglia..." button next to it. The browser's status bar at the bottom shows "Completa" and the URL "norma10.idris.fr".

- **Benefits**
  - IT & App managers happy not to re-invent the wheel
  - HPC centers want it locally, too
  - Excellent reference

Grazie!!!

