



Enabling Grids for E-science

GENIUS and EnginFrame: A successful EGEE technology transfer

Ing. Beppe Ugolotti

NICE srl

www.nice-italy.com

The EGEE Industry Day Conference

Parigi, LPNHE- 27.04.2006

www.eu-egee.org



- NICE**
- Grids & Grid Portals**
- Cases Histories**
- Future Trends**



- **Expertise in Grid deployment**
 - European company with 10 years experience with enterprise Grid solutions
 - Comprehensive professional service offering for commercial and EGEE middleware

- **Core business: the Global Grid Gateway**
 - **EnginFrame & GENIUS** Grid Portal product line
 - VAR channels with worldwide coverage for implementation and support (incl. industry leader Platform Computing)

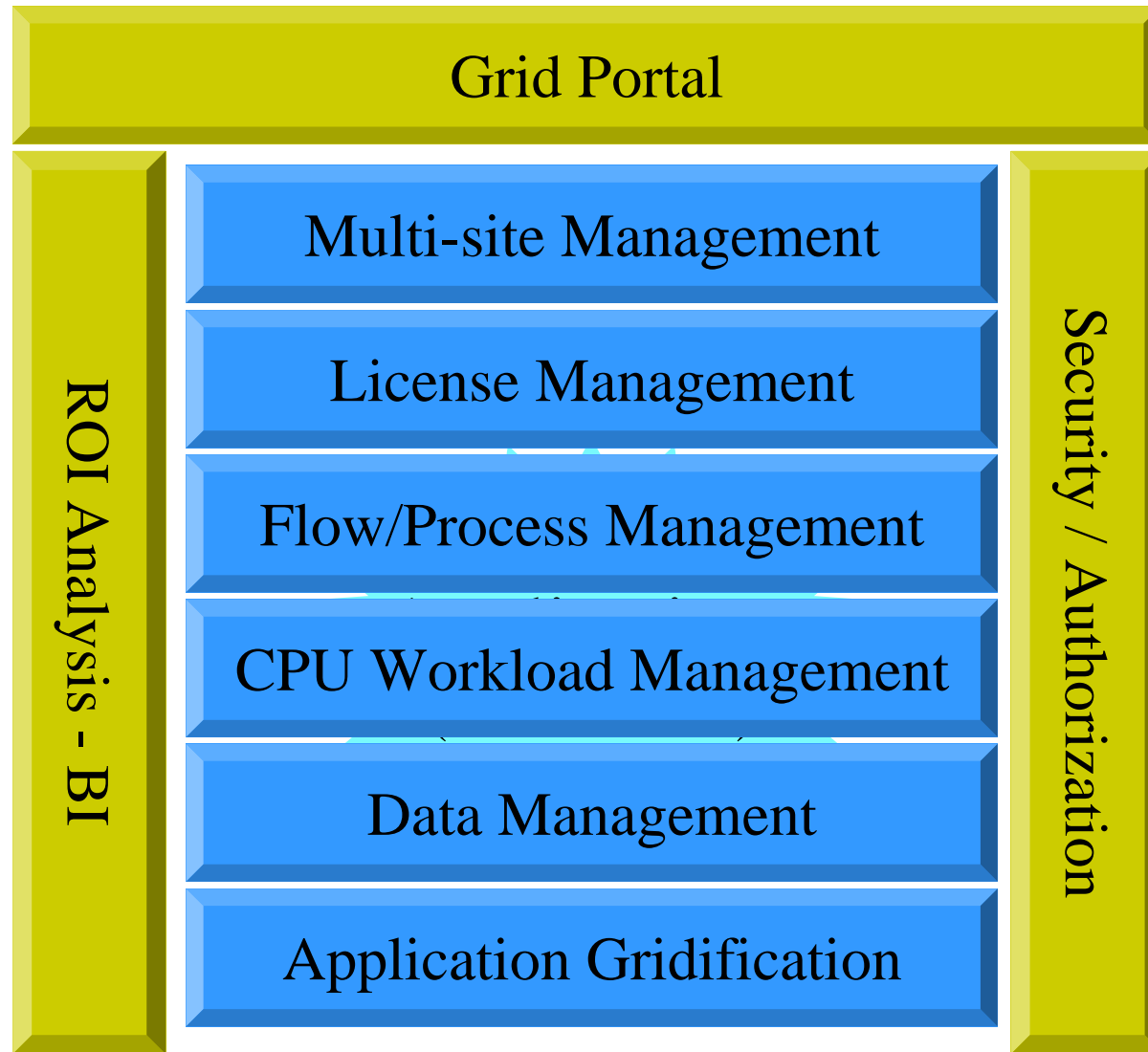
- **Other relevant competencies**
 - Server-based computing

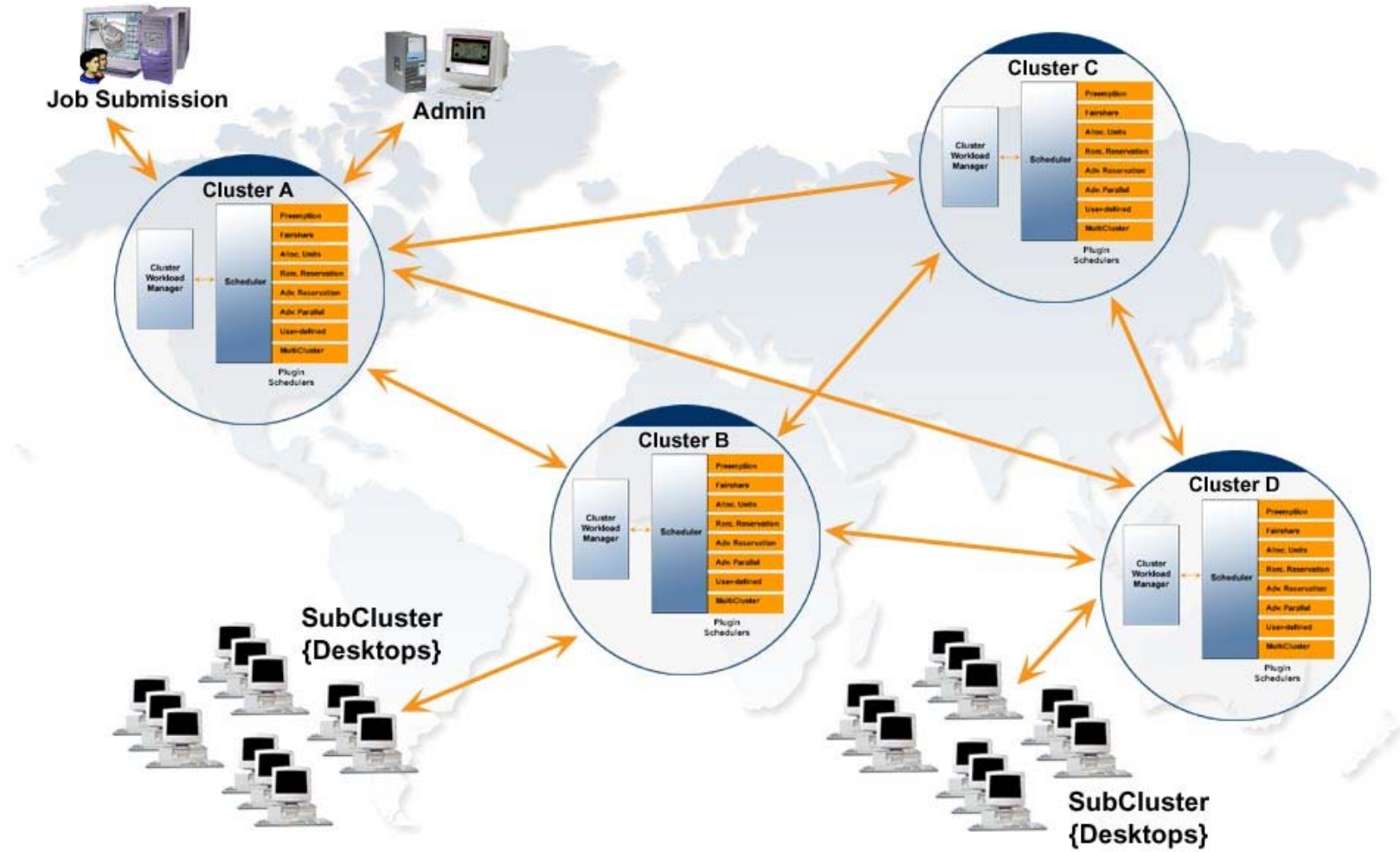
- **Mechanical**
 - Ferrari, Audi, BMW, FIAT Auto, Delphi, Elasis, Magneti Marelli, P+Z, Swagelok, Toyota, TRW
- **Manufacturing**
 - Bridgestone, Procter & Gamble, Galileo Avionica
- **Oil&Gas**
 - Slavneft, Schlumberger, TOTAL, VNIIGaz
- **Electronics**
 - STMicroelectronics, Accent, SensorDynamics, Motorola
- **Biotech**
 - ENEA, EGEE LS community
- **Telecom**
 - Telecom Italia
- **Research**
 - INFN, ASSC, CCLRC, CERN, CILEA, CINECA, CNR, CNRS/IN2P3, ENEA, FzU, ICI, IFAE, ITEP, JSC G.G.M., KU Leuven, SSC-Russia, SDSC
- **Education**
 - Dresda University, Ferrara University, ITU, Messina University, Politecnico of Milan, Technische Universität Dresden, Trinity College Dublin, Salerno University, S-PACI, IHEP Cina,

- NICE
- Grids & Grid Portals**
- Cases Histories
- Future Trends

The “ Grid Enviroment “

- ❑ Grid middleware
 - ✓ **API, Web Services (WSRF, WS-I, ...)**
- ❑ OS
 - ✓ **Heterogeneous**
 - ✓ **Virtualization**
- ❑ Hardware
 - ✓ **Heterogeneous**
 - ✓ **Supercomputers, clusters, workstations**
- ❑ Networks
 - ✓ **LAN, WAN, high speed networks, firewalls**
- ❑ Schedulers
 - ✓ **Resource sharing policies, SLA**
- ❑ Modeling, simulation, data analysis, algorithms
 - ✓ **Legacy, grid-enabled**
 - ✓ **Batch, interactive**
 - ✓ **Commercial, open source**
 - ✓ **Flows**
- ❑ Data
 - ✓ **Files, databases**
- ❑ Security
 - ✓ **AAA**
 - ✓ **IP protection**
- ❑ People
 - ✓ **Collaboration, distributed teams**
 - ✓ **Project-driven allocation, reservation**
 - ✓ **Costs sharing**



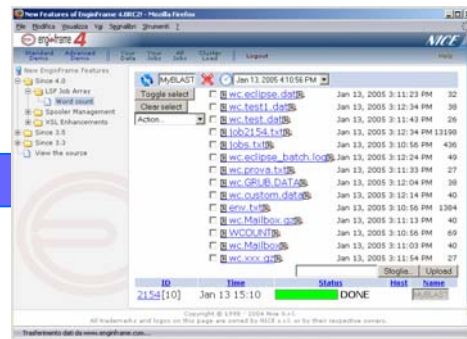


The Grid Portal vision



Clients

Standard
Web
Technology

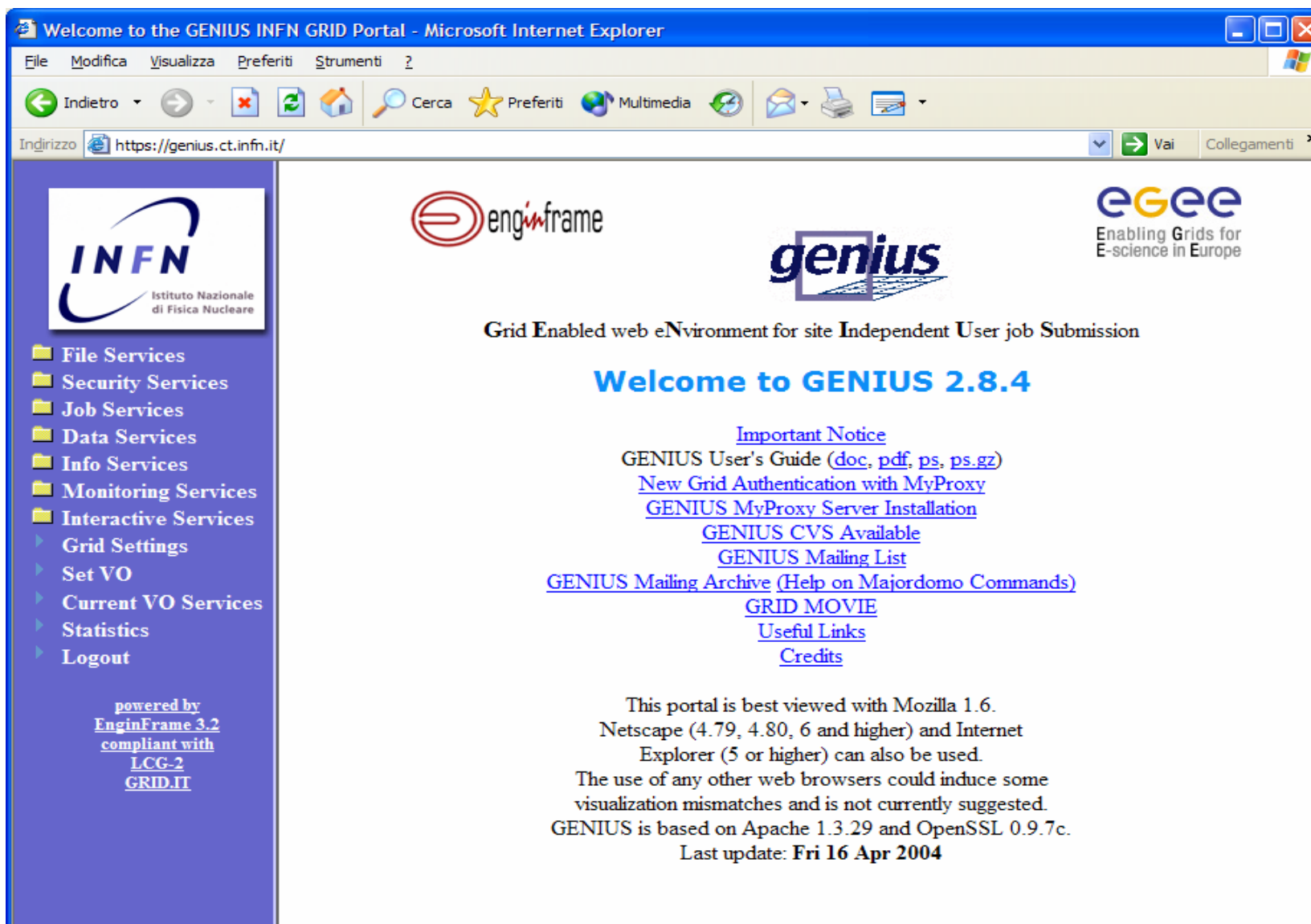


Interactive
Apps

Licenses
& Data

Grid /
Compute
Farm






Welcome to the GENIUS INFN GRID Portal - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Indietro - - - - - Cerca Preferiti Multimedia - - - - - Vai Collegamenti >>




Indirizzo <https://genius.ct.infn.it/>



INFN
Istituto Nazionale
di Fisica Nucleare

- File Services
- Security Services
- Job Services
- Data Services
- Info Services
- Monitoring Services
- Interactive Services
- Grid Settings
- Set VO
- Current VO Services
- Statistics
- Logout

powered by
[EnginFrame 3.2](#)
compliant with
[LCG-2](#)
[GRID.II](#)

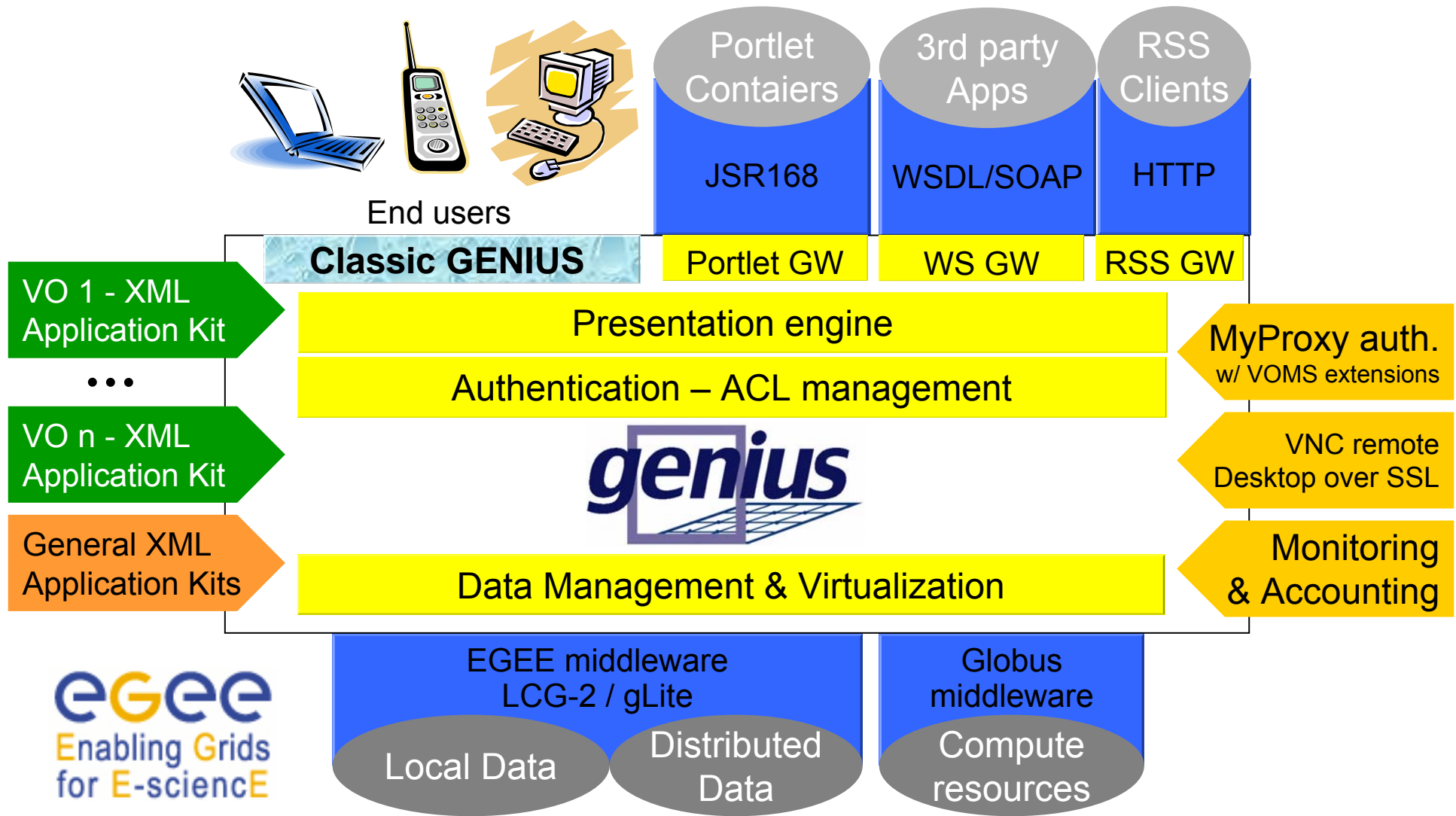
Grid Enabled web eNvironment for site Independent User job Submission

Welcome to GENIUS 2.8.4

[Important Notice](#)
[GENIUS User's Guide \(doc, pdf, ps, ps.gz\)](#)
[New Grid Authentication with MyProxy](#)
[GENIUS MyProxy Server Installation](#)
[GENIUS CVS Available](#)
[GENIUS Mailing List](#)
[GENIUS Mailing Archive \(Help on Majordomo Commands\)](#)
[GRID MOVIE](#)
[Useful Links](#)
[Credits](#)

This portal is best viewed with Mozilla 1.6.
 Netscape (4.79, 4.80, 6 and higher) and Internet
 Explorer (5 or higher) can also be used.
 The use of any other web browsers could induce some
 visualization mismatches and is not currently suggested.
 GENIUS is based on Apache 1.3.29 and OpenSSL 0.9.7c.
 Last update: **Fri 16 Apr 2004**







GENIUSphere: Data - Navigate

Enabling Grids for E-scienceE

Welcome to GENIUSphere Portal - Mozilla

Grid Enabled web environment for site Independent User job Submission

Logout
Welcome, NICE srl

Welcome | EnginFrame Portlet

Preferences | Files | Security | Accounting | Jobs | Data

Publish a File

Home

Publish a File

With this service you can publish local data on the Catalog of your Virtual Organization.

Choose File/Directory

Choose Remote File/Directory

Base Directory on Catalog /

Navigate Catalog

With this service you can navigate the Catalog of your Virtual Organization.

Selected files on Catalog

```
/Alberto/DAG.jdl  
/Alberto/hostname.jdl
```

Manage Dir on Catalog

With this service you can create or remove a directory on the Catalog of your Virtual Organization.

As mandatory requirement, the directory to remove must be empty.

Select the base dir / The default value is /

Rename on Catalog

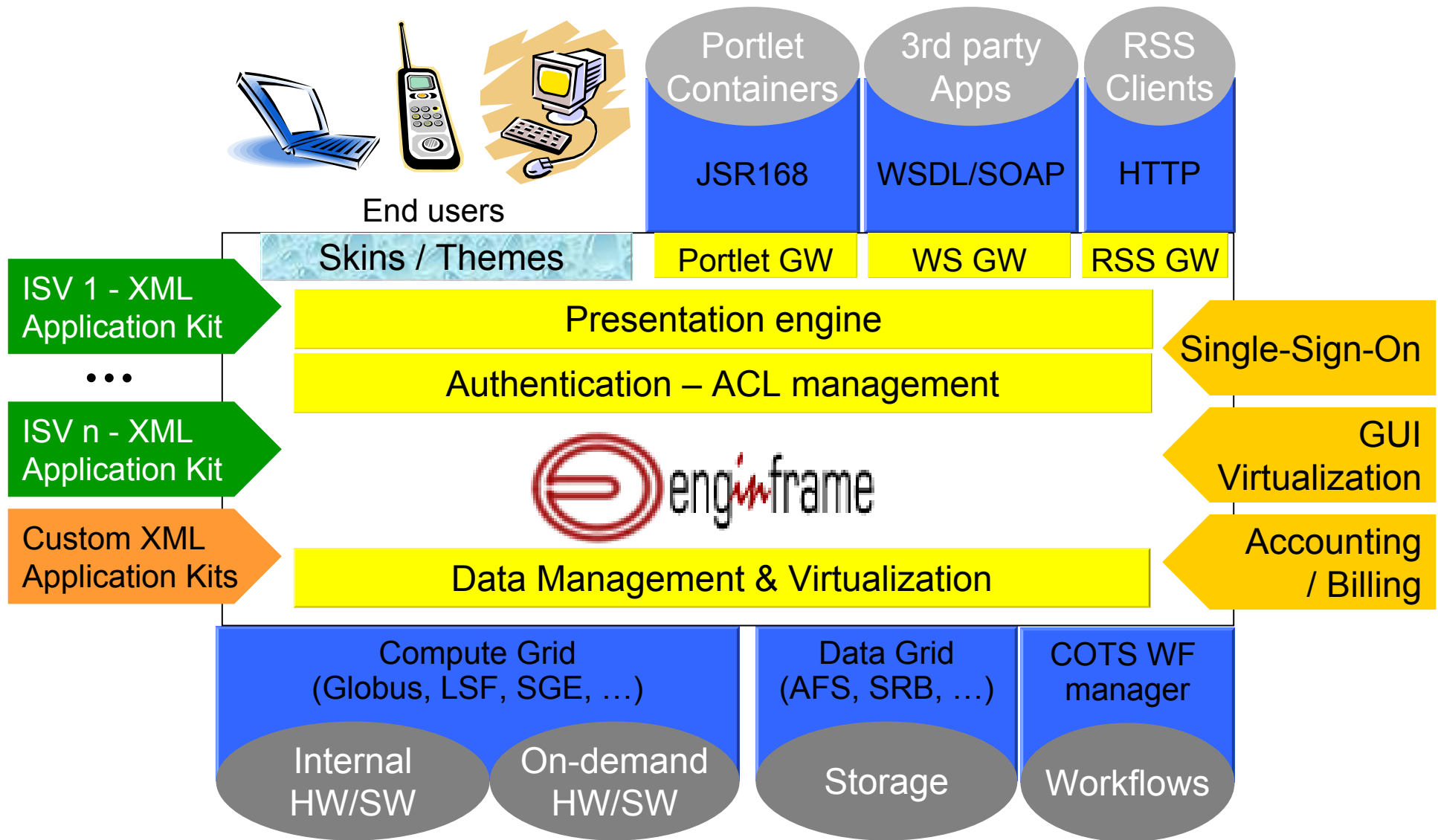
With this service you can rename a file or a directory on the Catalog of your Virtual Organization.

Select the Source file/dir name /

Destination file/dir name The end node only

Taskbar: m, [icons], cZ, [icons]





- NICE
- Grids & Grid Portals
- Cases Histories**
- Future Trends



Total Reservoir Portal - Mozilla Firefox

File Modifica Visualizza Vai Segnalibri Strumenti ?

http://www.enginframe.com/enginframe/reservoir/com.total.reservoir.xml?_uri=/com.total.reservoir/ec_d

La Repubblica.it » Ho... NICE - Projects - We... Euro to U.S. Dollar Ex... Bugzilla Main Page CmsAdmin < Admin <...
 Repubblica.it » cronaca » B Intercezzazioni, ... LinkedIn: Find People: Search Results

TOTAL HOME MY JOBS* ALL JOBS* LICENSES* QUEUES* LOGOUT efadm

Reservoir services
 ECLIPSE Affiliates
 ECLIPSE Advanced
 ECLIPSE Plan
 Admin
 Help

Classic studies
 Step 2 of 2.

Input data files:
 /data/ec/test128/plan3.DATA
 /data/ec/test128/plan6.DATA
 /data/ec/test128/plan9.DATA
 /data/ec/test128/plan15.DATA
 /data/ec/test128/plan16.DATA

Required n. CPU: 1
 Simulator: eclipse
 Version: 2004a_1 (default)
 Start tonight
 Start next weekend
 Fast execution

Completato

Schlumberger - Mozilla Firefox

File Modifica Visualizza Vai Segnalibri Strumenti ?

http://www.enginframe.com/enginframe/slb/com.slb.services.xml?_service=eclipse&_fol

spaci hpc portal

Schlumberger

home | my data | my jobs | all jobs | cluster info | logout demo Language...

Schlumberger Services
 ECLIPSE
 ECLIPSE Wizard

ECLIPSE
 Here is the ECLIPSE simulation service.

Input data file: Select..

Number of processors: 1

Simulator: Parallel_Eclipse

Version: 2005a

Execution host type: ANY

Required memory: MBytes

Maximum runtime: [hours:]minutes

Interconnect type: Gigabit

Computing queue: normal (Active, 0 jobs, 0 running)

Exclusive Job
 Use local configuration

Submit

Completato



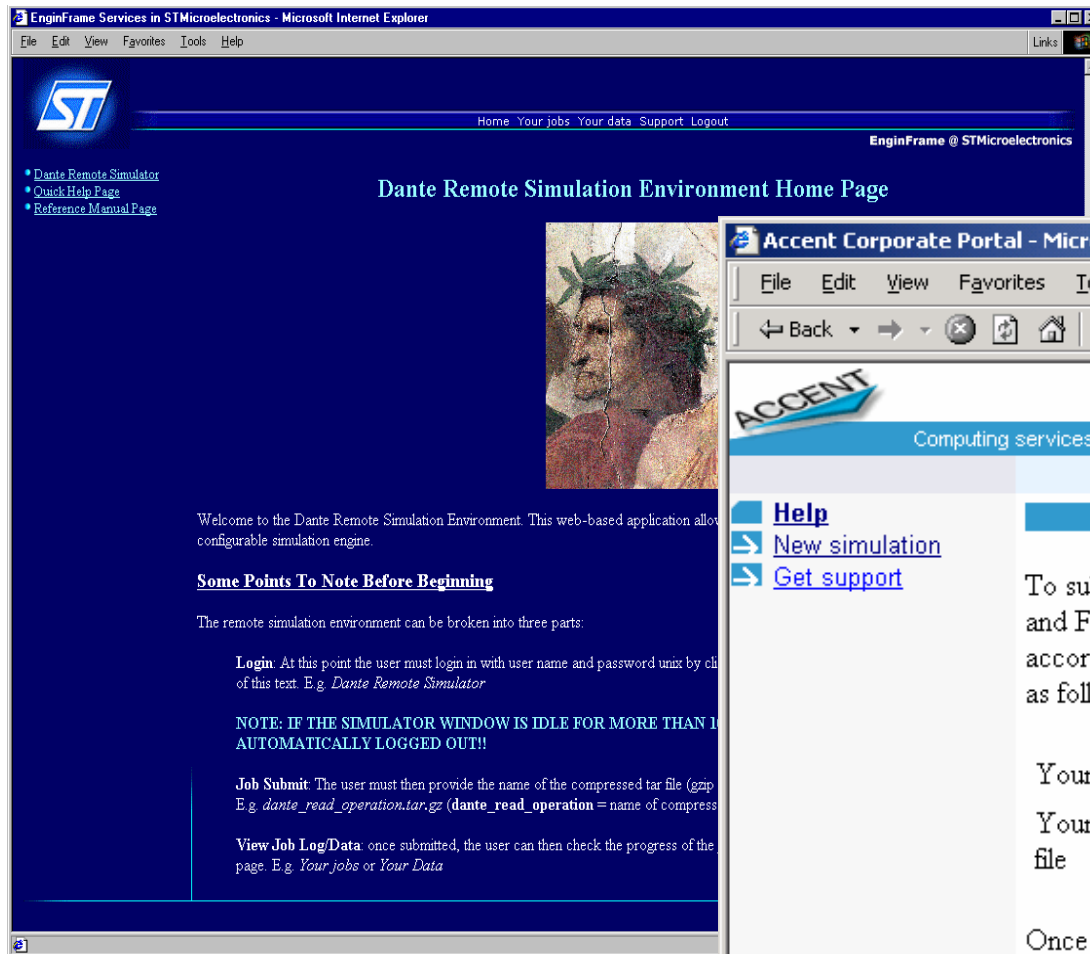


MCAE portals in Automotive

Enabling Grids for E-science

The screenshot displays a web-based CAE portal interface. On the left, a sidebar lists software packages: Abaqus, Ansys, Dyna, Fluent, and Nastran. The main content area is titled "CAE PORTAL" and features a "Service offerings" menu with links to LSDYNA, NASTRAN, ABAQUS, ADAMS, POWERFLOW, CFDP, MCFD, PAMCRASH, AKUSMOD, and Data_Host. The "LSDYNA" section is active, showing a "JOB DESCRIPTION" form with fields for "INPUT FILE:", "QUEUE SELECTION:", "N. CPU (MAX. 8):", "MEMORY:", "VERSION:", "RESTART FILE:", and "ADDITIONAL OPTIONS:". A "SUBMIT JOB" button is located below the form. The interface is powered by EngineFrame. In the background, a Microsoft Internet Explorer window shows the Audi World Site, displaying "Audi Corporate ASP Powered by EngineFrame + FlowGuide" and a list of links including "AudiPamcrash_preprocessed".





EnginFrame Services in STMicroelectronics - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Home Your jobs Your data Support Logout

EnginFrame @ STMicroelectronics

Dante Remote Simulation Environment Home Page

- Dante Remote Simulator
- Quick Help Page
- Reference Manual Page

Welcome to the Dante Remote Simulation Environment. This web-based application allows you to submit and manage your simulation jobs in a configurable simulation engine.

Some Points To Note Before Beginning

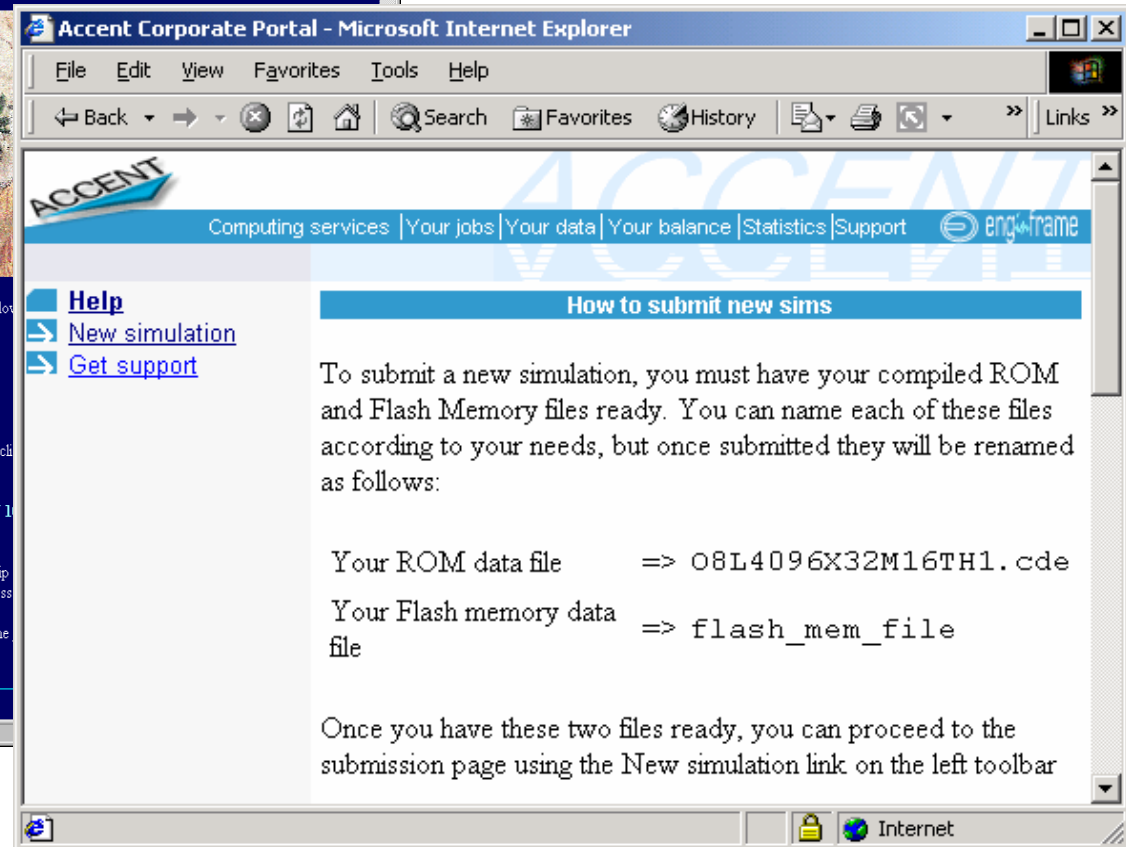
The remote simulation environment can be broken into three parts:

Login: At this point the user must login in with user name and password using the following format: `username@hostname`. E.g. `dante_read_operation@st.com`

NOTE: IF THE SIMULATOR WINDOW IS IDLE FOR MORE THAN 15 MINUTES, THE USER WILL BE AUTOMATICALLY LOGGED OUT!!

Job Submit: The user must then provide the name of the compressed tar file (gzip). E.g. `dante_read_operation.tar.gz` (`dante_read_operation` = name of compressed tar file)

View Job Log/Data: once submitted, the user can then check the progress of the simulation. E.g. `Your jobs` or `Your Data`



Accent Corporate Portal - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Links

Computing services | Your jobs | Your data | Your balance | Statistics | Support

Help

- New simulation
- Get support

How to submit new sims

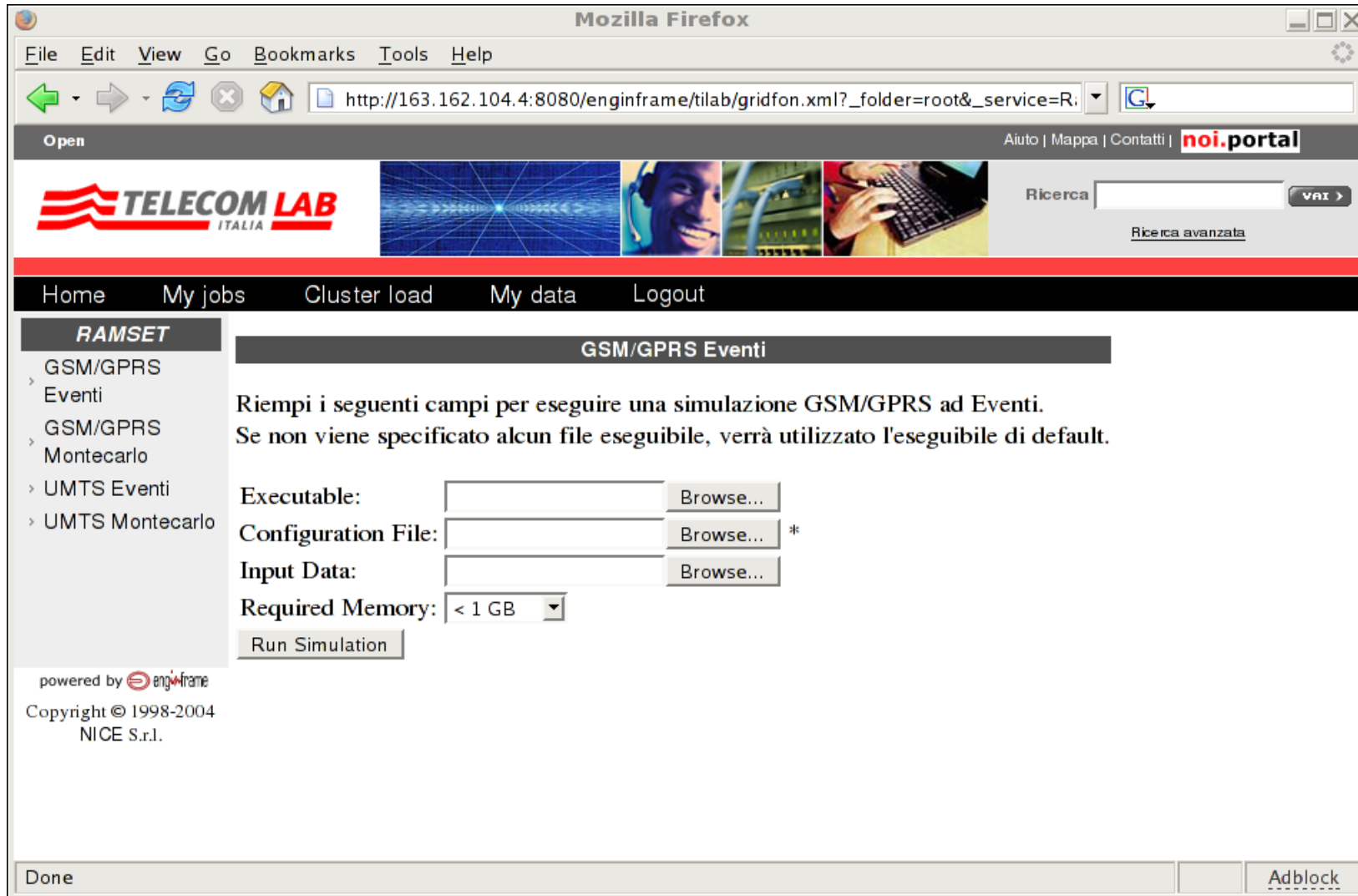
To submit a new simulation, you must have your compiled ROM and Flash Memory files ready. You can name each of these files according to your needs, but once submitted they will be renamed as follows:

Your ROM data file => `08L4096X32M16TH1.cde`

Your Flash memory data file => `flash_mem_file`


Once you have these two files ready, you can proceed to the submission page using the New simulation link on the left toolbar

Black-box for EDA simulation



RAMSET

- › GSM/GPRS
- › Eventi
- › GSM/GPRS Montecarlo
- › UMTS Eventi
- › UMTS Montecarlo

powered by  enginframe
 Copyright © 1998-2004
 NICE S.r.l.

GSM/GPRS Eventi

Riempi i seguenti campi per eseguire una simulazione GSM/GPRS ad Eventi.
 Se non viene specificato alcun file eseguibile, verrà utilizzato l'eseguibile di default.

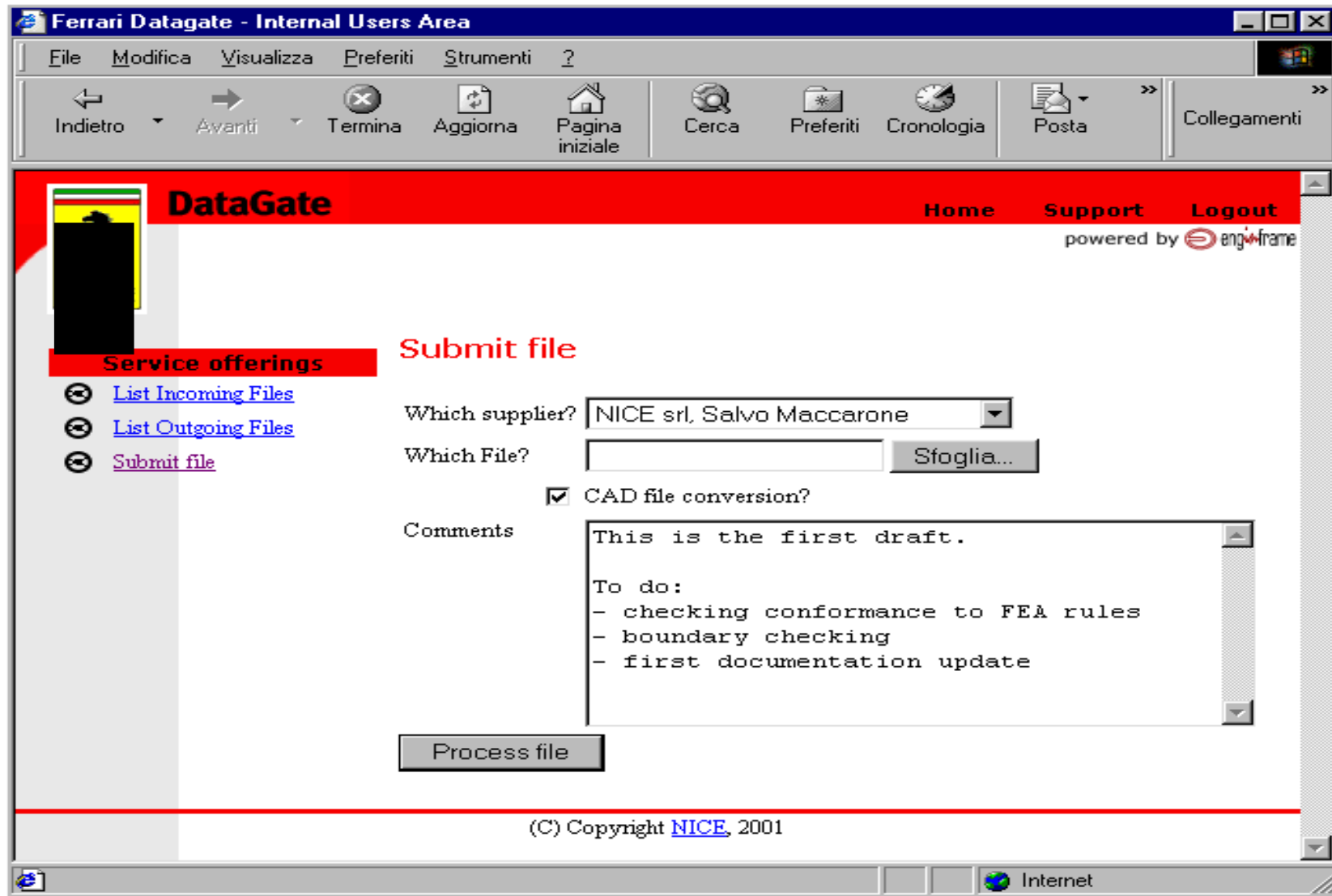
Executable:

Configuration File: *

Input Data:

Required Memory: < 1 GB

Done



Ferrari Datagate - Internal Users Area

File Modifica Visualizza Preferiti Strumenti ?

Indietro Avanti Termina Aggiorna Pagina iniziale Cerca Preferiti Cronologia Posta Collegamenti

DataGate Home Support Logout
powered by eng4frame

Service offerings

- List Incoming Files
- List Outgoing Files
- Submit file

Submit file

Which supplier? NICE srl, Salvo Maccarone

Which File? Sfoglia...

CAD file conversion?

Comments

This is the first draft.

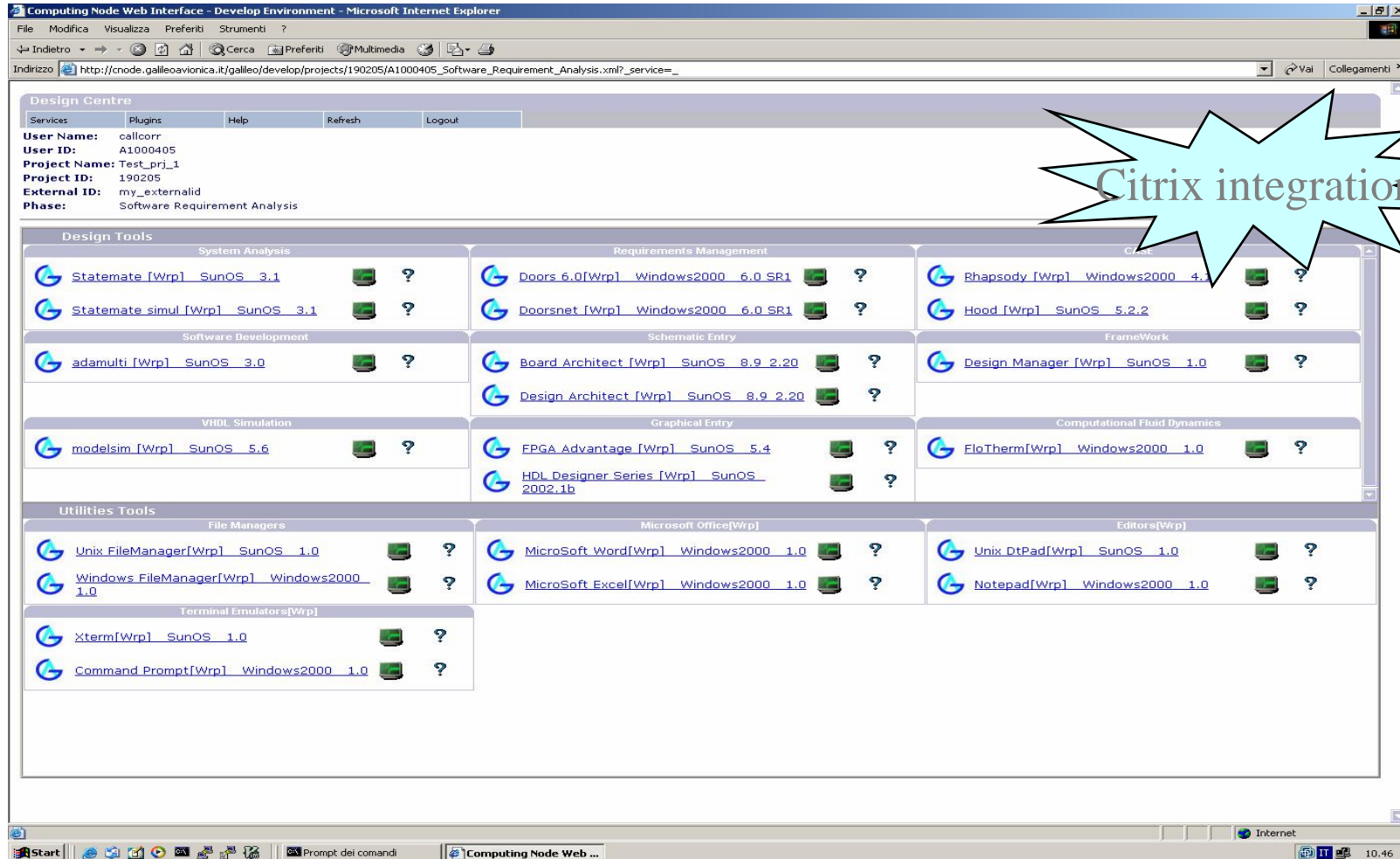
To do:

- checking conformance to FEA rules
- boundary checking
- first documentation update

Process file

(C) Copyright NICE, 2001

Internet



The screenshot shows a web browser window titled "Computing Node Web Interface - Develop Environment - Microsoft Internet Explorer". The address bar shows a URL: http://cnode.galleoavionica.it/galleo/develop/projects/190205/A1000405_Software_Requirement_Analysis.xml?_service=_

The main content area is titled "Design Centre" and includes a navigation menu with "Services", "Plugins", "Help", "Refresh", and "Logout". Below this, user and project information is displayed:

- User Name: callcorr
- User ID: A1000405
- Project Name: Test_prj_1
- Project ID: 190205
- External ID: my_externalid
- Phase: Software Requirement Analysis

The interface is organized into several sections of software tools, each with a category header and a list of tools with icons and status indicators:

- Design Tools**
 - System Analysis**: Statestate [Wrp] SunOS 3.1, Statestate simul [Wrp] SunOS 3.1
 - Requirements Management**: Doors 6.0[Wrp] Windows2000 6.0 SR1, Doorsnet [Wrp] Windows2000 6.0 SR1
 - Software Development**: adamulti [Wrp] SunOS 3.0
 - Schematic Entry**: Board Architect [Wrp] SunOS 8.9 2.20, Design Architect [Wrp] SunOS 8.9 2.20
 - VHDL Simulation**: modelsim [Wrp] SunOS 5.6
 - Graphical Entry**: FPGA Advantage [Wrp] SunOS 5.4, HDL Designer Series [Wrp] SunOS 2002.1b
 - FrameWork**: Design Manager [Wrp] SunOS 1.0
 - Computational Fluid Dynamics**: FloTherm[Wrp] Windows2000 1.0
- Utilities Tools**
 - File Managers**: Unix FileManager[Wrp] SunOS 1.0, Windows FileManager[Wrp] Windows2000 1.0
 - Microsoft Office[Wrp]**: MicroSoft Word[Wrp] Windows2000 1.0, MicroSoft Excell[Wrp] Windows2000 1.0
 - Editors[Wrp]**: Unix DtPad[Wrp] SunOS 1.0, Notepad[Wrp] Windows2000 1.0
 - Terminal Emulators[Wrp]**: Xterm[Wrp] SunOS 1.0, Command Prompt[Wrp] Windows2000 1.0

A starburst graphic with the text "Citrix integration" is overlaid on the right side of the interface.

Centralized eDesign Services





HPC demo-center & ASP

Enabling Grids for E-science

The screenshot shows the Microsoft Internet Explorer browser window displaying the GridAge website. The address bar shows the URL <http://www.gridage.com>. The browser interface includes a menu bar (File, Modifica, Visualizza, Preferiti, Strumenti), a toolbar with navigation buttons (Indietro, Avanti, Home, Cerca, Preferiti), and a status bar at the bottom showing "Internet".

The website header features the GridAge logo on the left and a login form on the right with fields for "Login" and "Password" and a "Go" button. A navigation menu on the left lists: HOME, GRID AGE, TRY GRID ONLINE, PARTNERS, SOLUTIONS, NEWS & EVENTS, and CONTACTS.

The main content area is divided into sections:

- News**: A list of four news items with expandable details:
 - MSC.Actran™ now on GridAge for efficient vibroacoustics simulation
 - Intel tops off 64-bit server platform portfolio
 - Intel Silicon Breakthrough Speeds Server, Network Responsiveness
 - Newly formed Intel® Software Network creates 'one-stop shop' for ...
- What is Grid?**: A section with a red arrow icon. The text reads: "Tracing its roots into distributed computing architectures, **Grid computing** enables geographically dispersed systems to share and virtualize their applications, data and computational resources. More than just a vision, Grid computing delivers measurable business value, particularly among organizations with compute or data-intensive demands. With Grid Computing, companies can balance the supply and demand of computing cycles and resources by providing users with a single, transparent, aggregated source of computing power. Ultimately, it provides the ability to lower the total cost of computing by providing on-demand, reliable and transparent access to available computer resources..." Below this text is a "Read more: [About Grid](#)" link.
- Why GridAge?**: A section with a red arrow icon. The text reads: "The **GridAge** initiative - born from the collaboration between HP, Intel, MSC.Software and Nice - is becoming the reference site for those people that are involved with technical-scientific computing both in educational and industrial departments. **GridAge** offers information on the most important events that concern the world of the *High Performance Computing (HPC)* and give the real opportunity to be updated on the evolution of the solutions of this specific sector..." Below this text is a "Read more: [Why GridAge](#)" link.

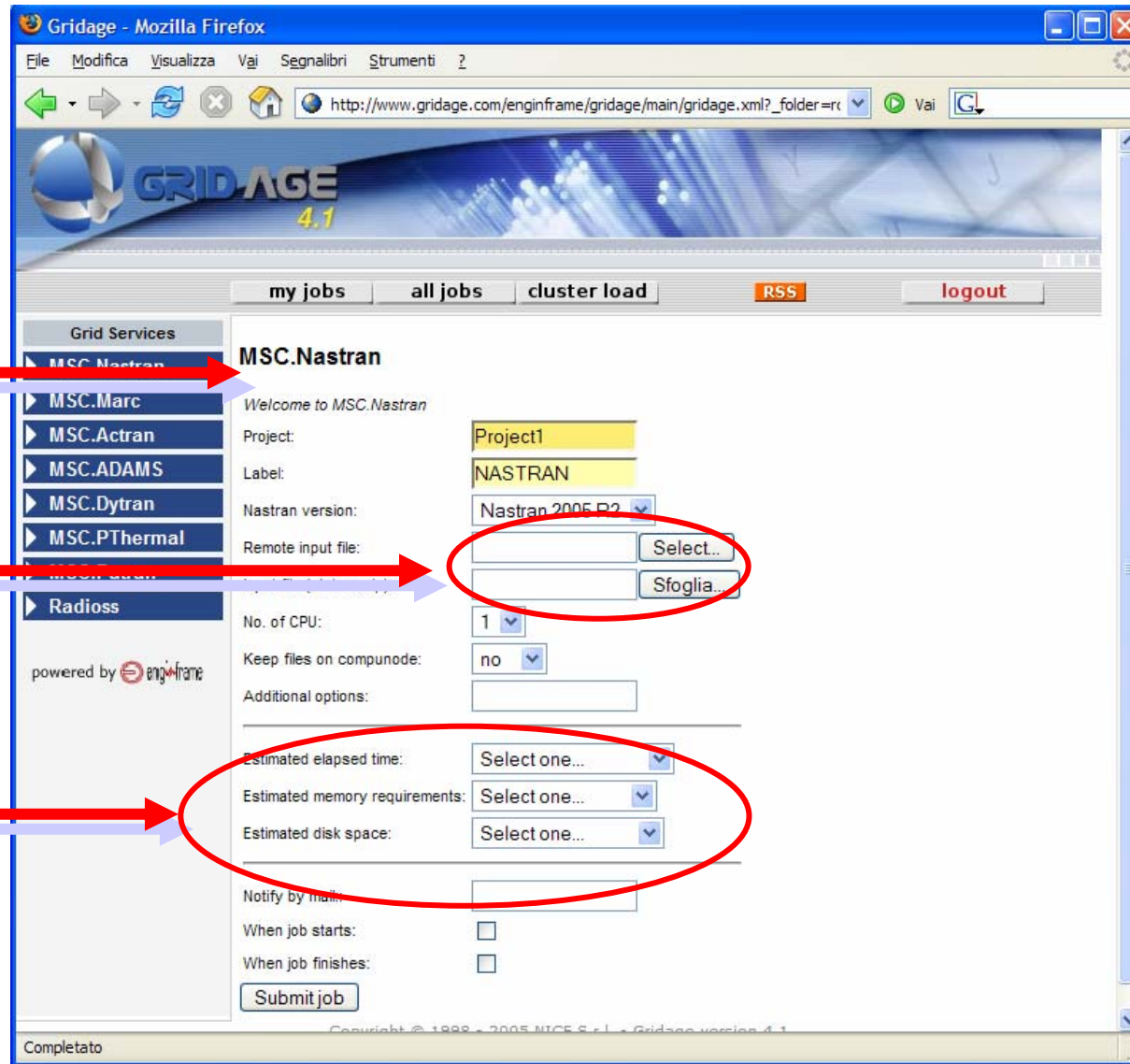
A search box with a "Search" button is located at the bottom left of the main content area. At the bottom of the page, there is a footer with logos for MSC SOFTWARE, hp, NICE, and intel, along with their respective website URLs: www.mscsoftware.com, www.hp.com, www.nice-italy.com, and www.intel.com. A "Print" button is also visible in the footer.

<http://www.GridAge.com>

*User friendly,
Application-oriented
Job submission*

*Flexible and efficient
Input file management*

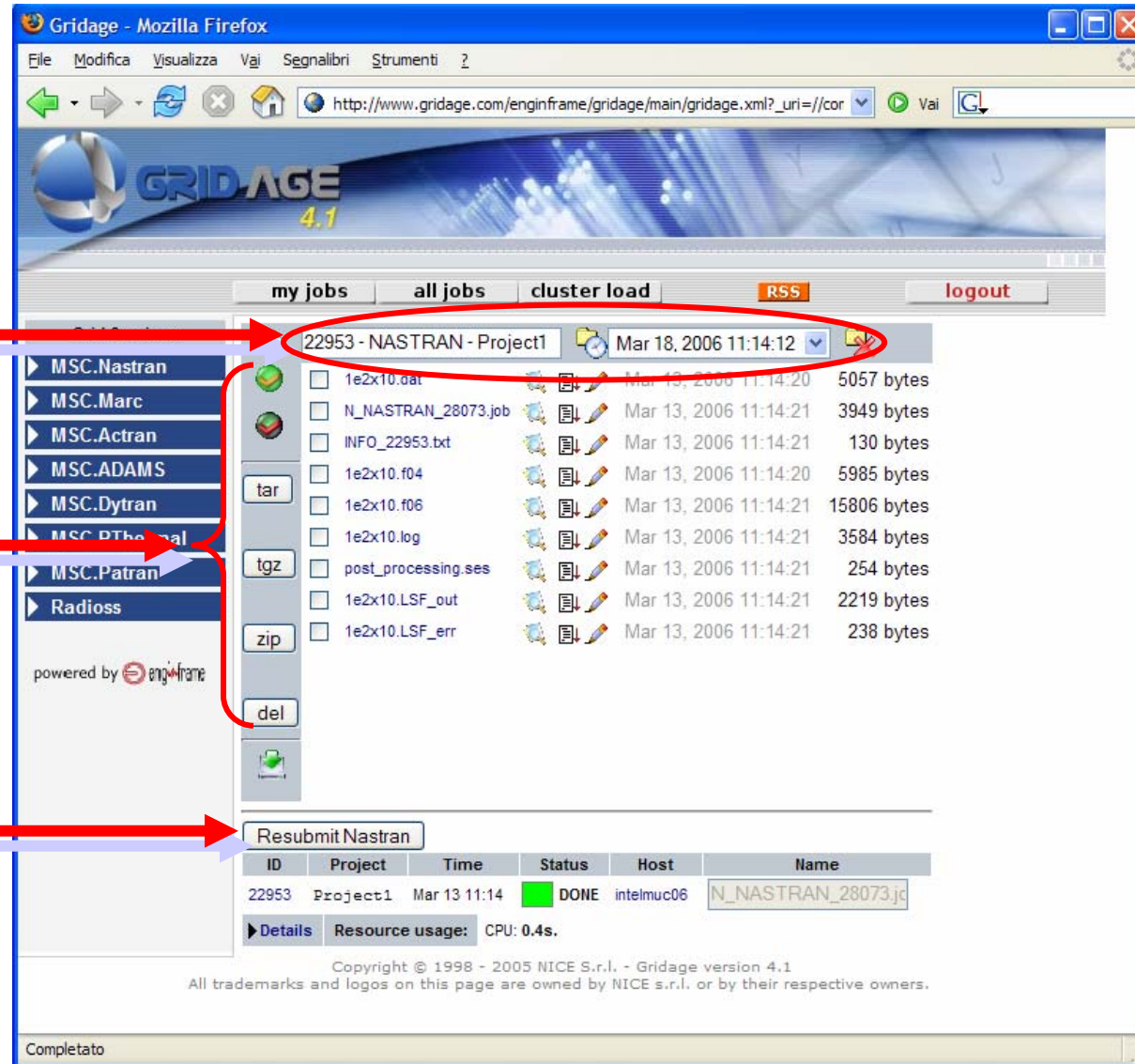
*Hide complexity of
Underlying scheduler*



Data lifecycle management

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

Follow-up actions support



The screenshot shows the Gridage 4.1 web interface in Mozilla Firefox. The browser address bar shows the URL: http://www.gridage.com/engineframe/gridage/main/gridage.xml?_uri=//cor. The interface has a navigation menu with 'my jobs', 'all jobs', 'cluster load', 'RSS', and 'logout'. The main content area displays a list of files for job '22953 - NASTRAN - Project1' (dated Mar 18, 2006 11:14:12). The files list includes:

File Name	Size
1e2x10.dat	5057 bytes
N_NASTRAN_28073.job	3949 bytes
INFO_22953.txt	130 bytes
1e2x10.f04	5985 bytes
1e2x10.f06	15806 bytes
1e2x10.log	3584 bytes
post_processing.ses	254 bytes
1e2x10.LSF_out	2219 bytes
1e2x10.LSF_err	238 bytes

Below the file list, there are buttons for 'tar', 'tgz', 'zip', and 'del'. A 'Resubmit Nastran' button is also visible. At the bottom, a table shows job details:

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

Additional information includes 'Resource usage: CPU: 0.4s.' and a copyright notice: 'Copyright © 1998 - 2005 NICE S.r.l. - Gridage version 4.1. All trademarks and logos on this page are owned by NICE s.r.l. or by their respective owners.'



EnginFrame Mechanical Design Automation demo site! - Microsoft Internet Explorer

enginframe MECHANICAL GRID PORTAL

My jobs | My data | Cluster load | Logout

Service offerings

- LIBRARY definition
- Mechanical FEA services
- Mechanical CFD services
- Mechanical Crash services

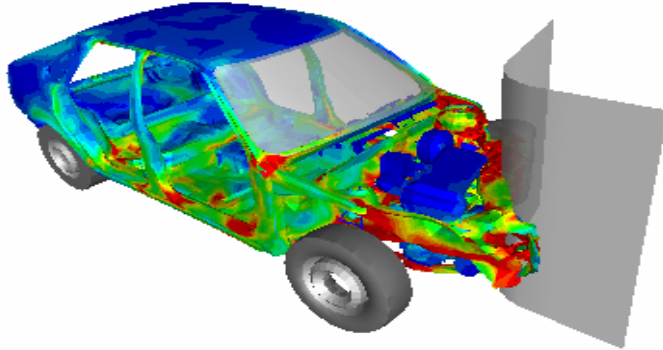
Directory contents - Isdyna simulation

Destroy

Toggle select

<input checked="" type="checkbox"/>	lsdyna.txt	3792	<input checked="" type="checkbox"/>	car.vtf	2518176
	Dec 20, 2004 12:25:28 PM			Dec 20, 2004 12:29:42 PM	

simulation



Frame: 9/9
Step: 5

ID	Time	Status	Host	Name
26004	Dec 20 12:23	DONE	antilla	lsdyna simulation

Resource usage: CPU: 105.5s.





Enabling Grids for E-science

Grid Intelligence

The image displays three overlapping screenshots of the Cognos PowerPlay Web Explorer interface, each showing a different data cube. The windows are titled 'Job Throughput cube', 'Workload cube', and 'Job Resource Consumption cube'. Each window features a navigation pane on the left, a main chart area, and a data table at the bottom.

Job Throughput cube: Shows 'Overall job throughput by business hour'. The chart is a bar graph comparing 'Core hours' and 'Non-core hours' for the month of April 2003. The table below the chart shows the following data:

MEASURES	2003/Apr
# of submitted jobs as values	Core hours
# of submitted jobs	251,029
# of done jobs	210,017
# of exited jobs	34,065
MEASURES	NA

Workload cube: Shows 'Types of hosts completing jobs the fastest'. The chart is a bar graph comparing 'LINUX' and 'SUN/SOL' hosts. The table below the chart shows the following data:

MEASURES	2003/Apr
Avg run time/job (min) as values	LINUX
Avg run time/job (min)	9.94
Avg run time/job (min) as values	SUN/SOL
Avg run time/job (min)	12.2

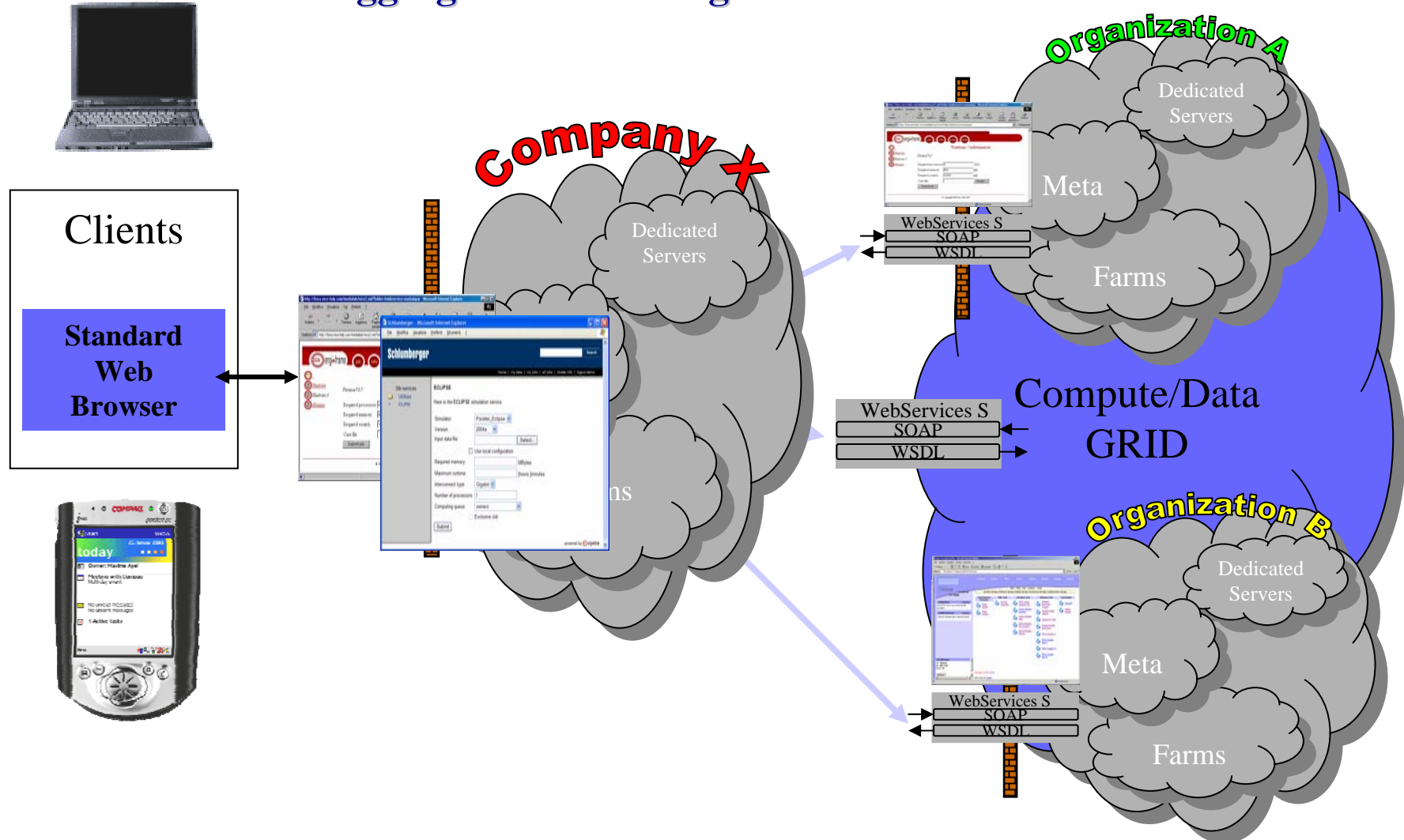
Job Resource Consumption cube: Shows 'Resource consumption by project'. The chart is a 3D bar graph showing usage in minutes for various projects across different resources. The table below the chart shows the following data:

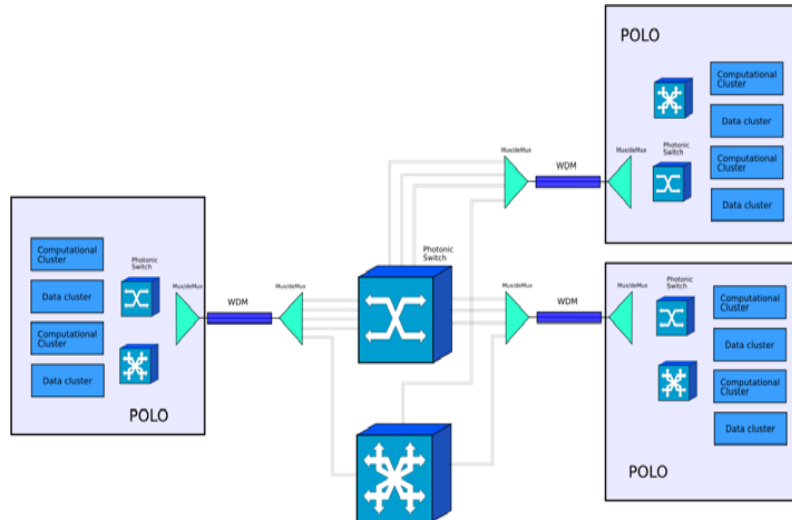
Project	Usage (minute) as values
Design	
Implementation	
Integration	
Modeling	
Verification	

- NICE
- Grids & Grid Portals
- Cases Histories
- Future Trends**



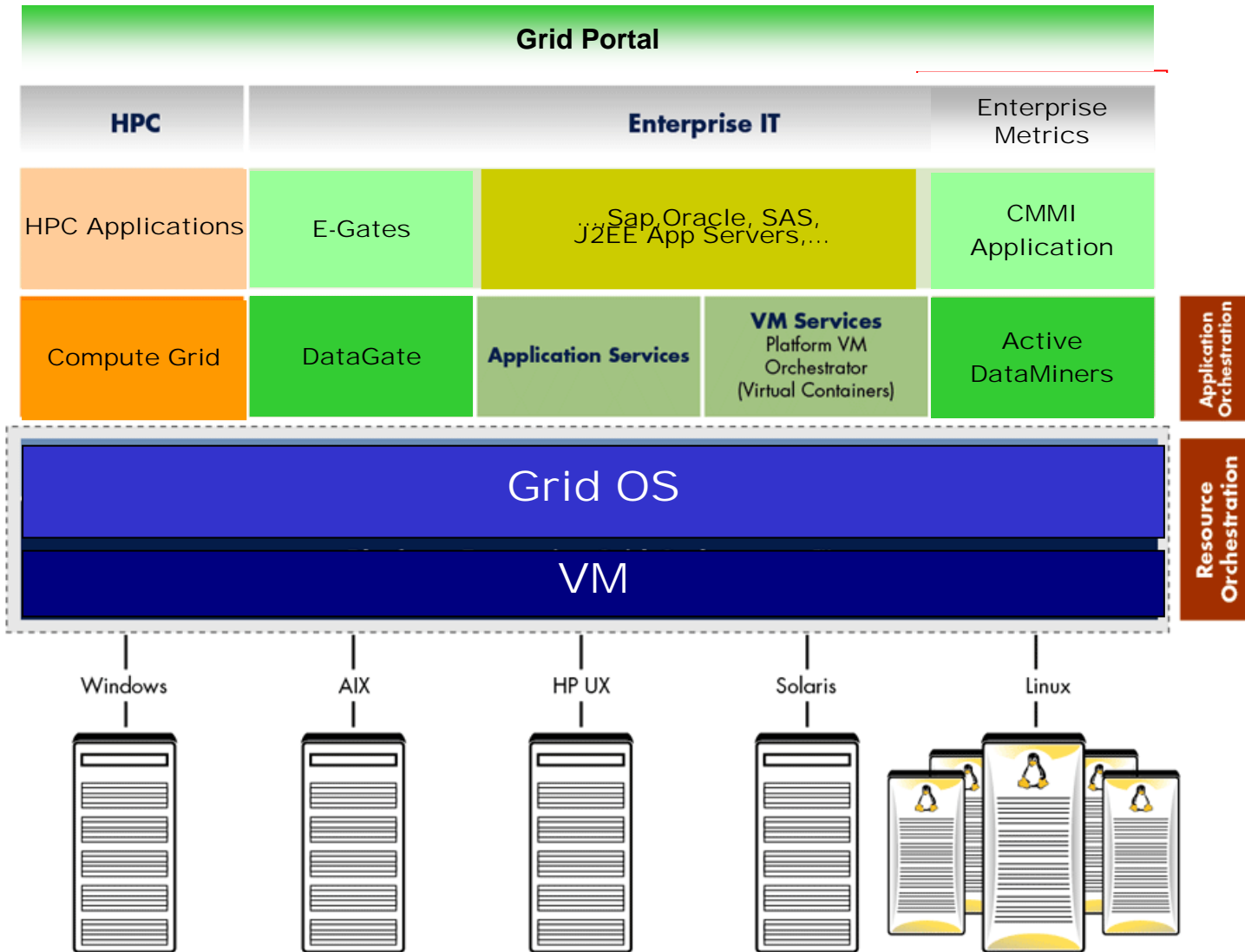
Different services from different Organizations are aggregated into a single cohesive offer!

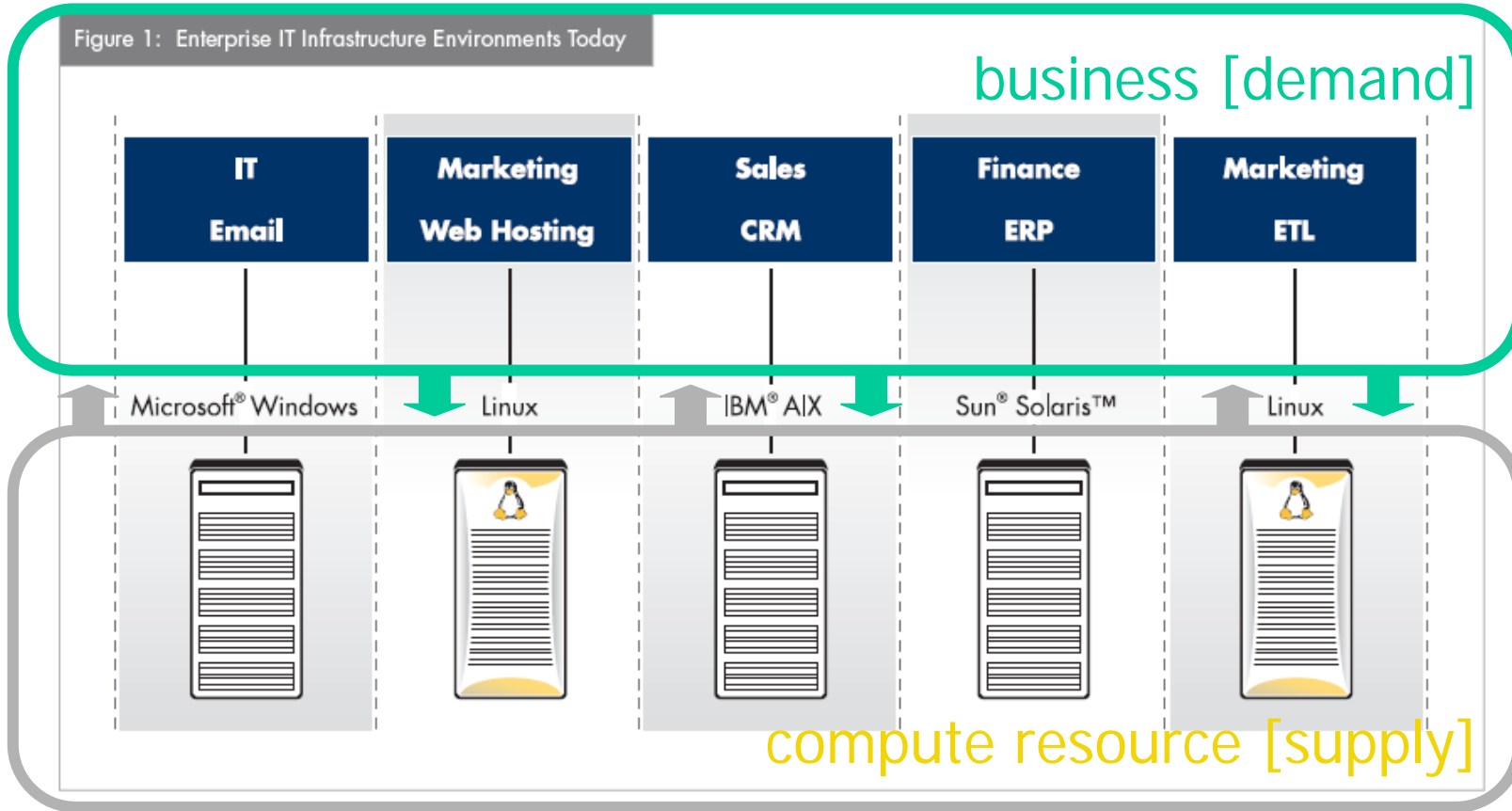




- **Orthogonalization between “glass pipes” and illumination technology**
 - “Future proof”: will survive the 10GbE to 40GbE transition (2007?)
 - Can support both GbE and Infiniband
- **“application driven” network configuration**
 - Explicit allocation of lambdas to multi-centers meta computers

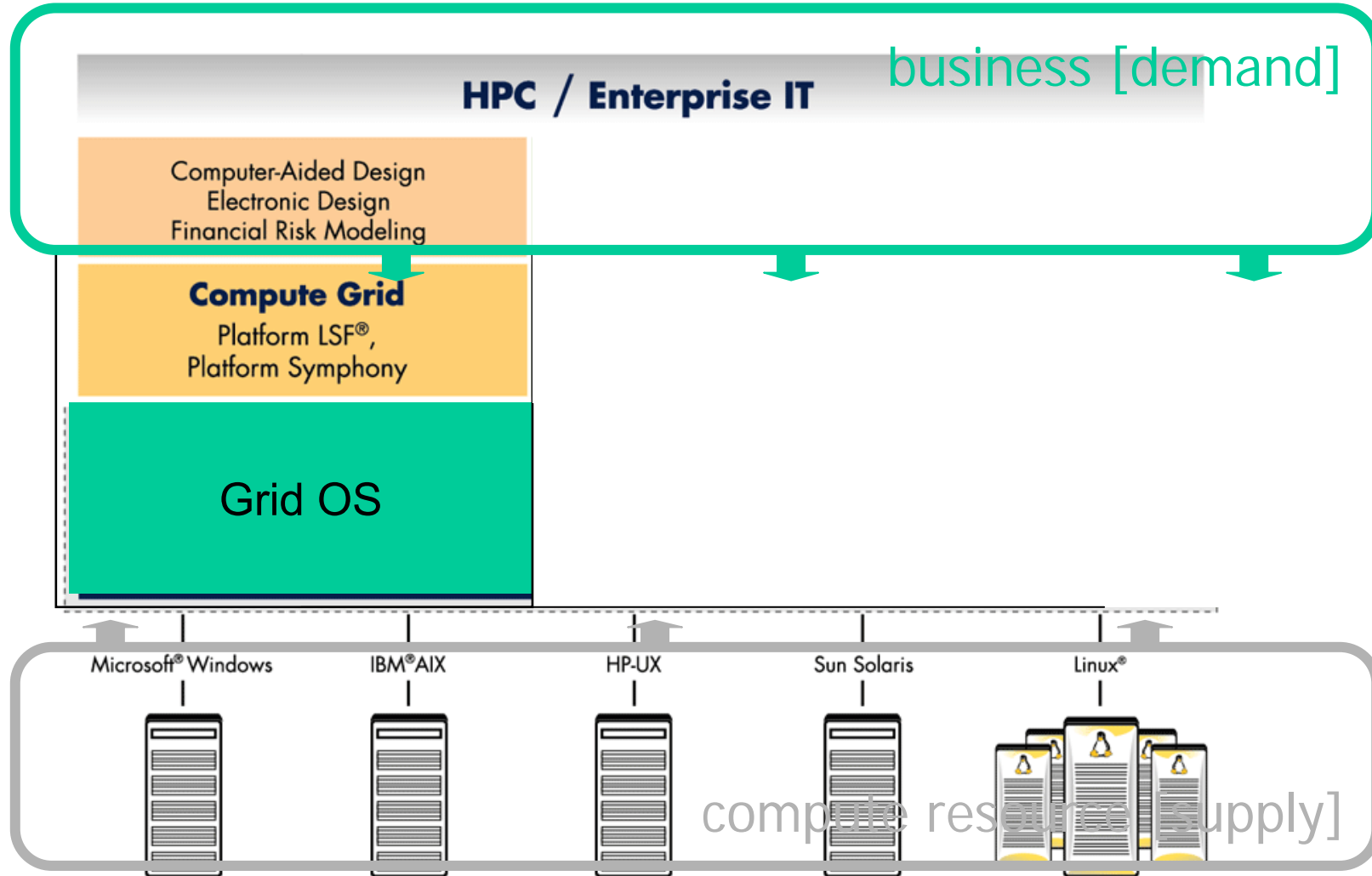
Grid Infrastructure vision





Business [demand] and compute resources [supply] are tightly coupled in silo-ed technology, applications, LOB, and second generation virtualization solutions.





Thanks for your attention!

Q&A

