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Enabling Grids for
E-science in Europe

www.eu-egee.org

GENIUS and EnginFrame

Roberto Barbera
EGEE NA4 Generic Applications coordinator



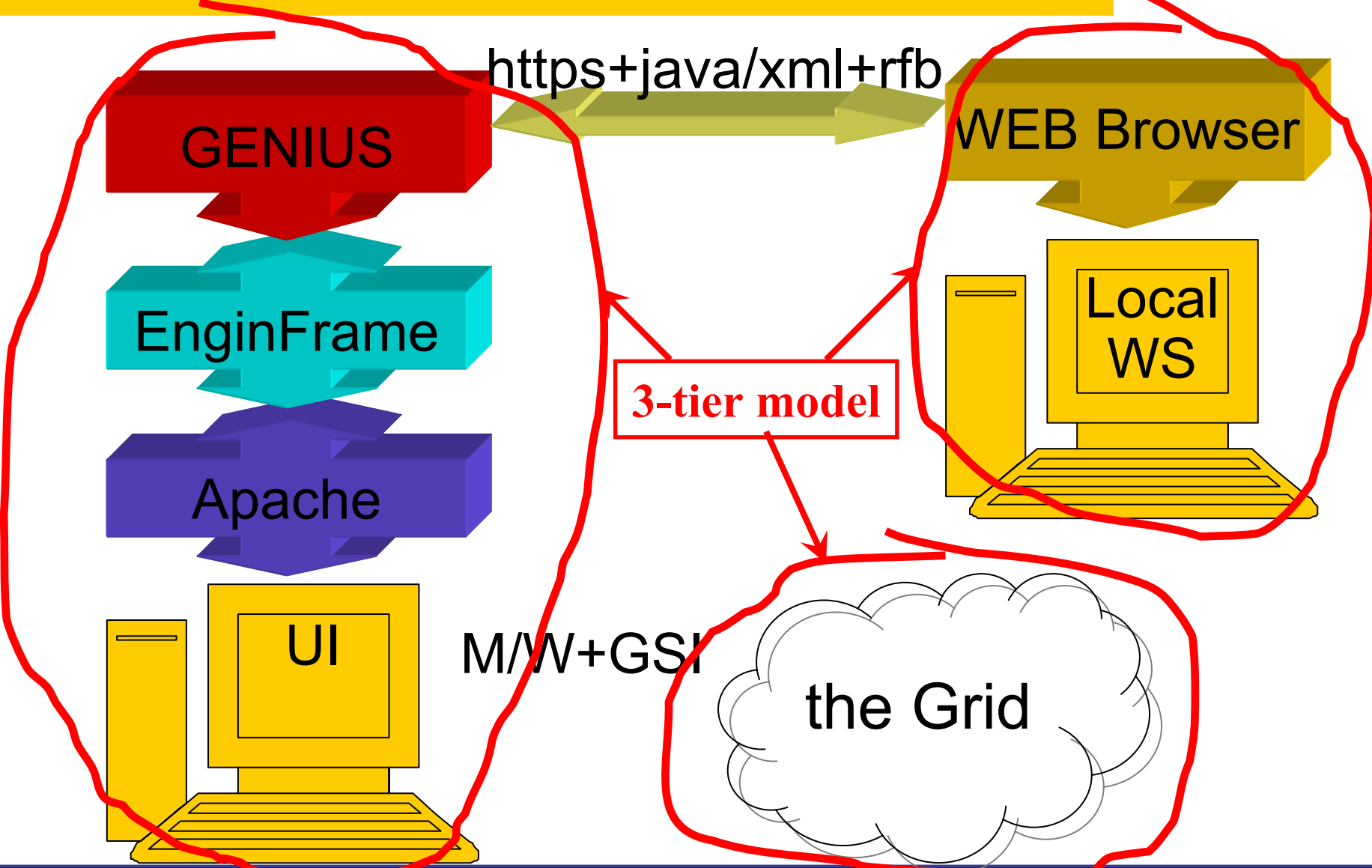
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- An example of EnginFrame service
- FAQs and answers



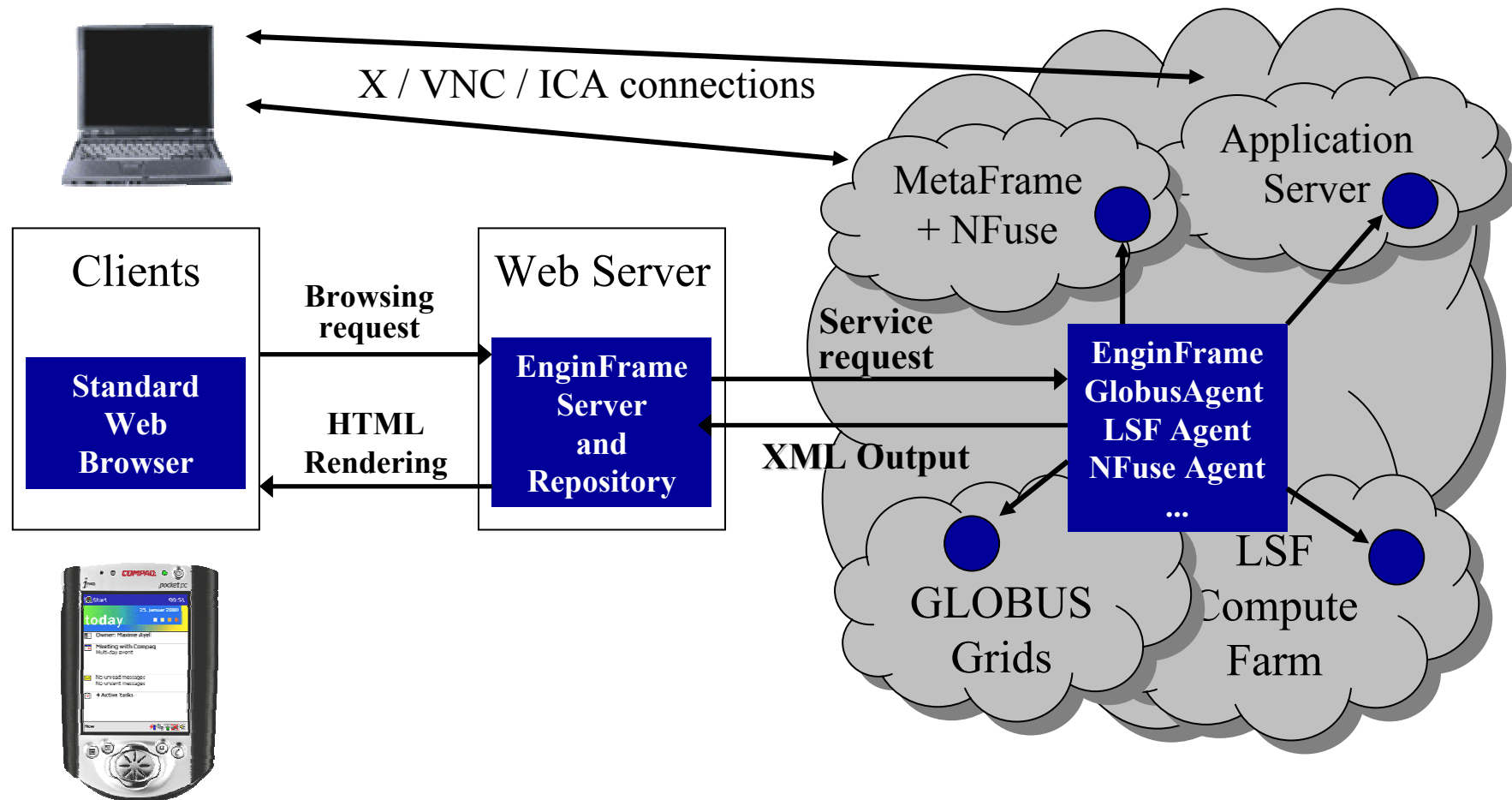
GENIUS: how it works



Enginframe in brief

- Standards-based GRID portal framework
 - Java, Tomcat/JServ, Apache, XML/XSL → GridML
- Solves back-end integration problems
 - **Visual rendering** for most Grid objects
 - jobs, job arrays, hosts, services, databases, etc.
 - **Multiple Grid & Cluster technologies** support
 - EDG, Globus, LSF, SGE, Condor (soon)
 - **Authentication delegation** (GSI, MyProxy, AFS, NIS, NT, Kerberos V, ...)
 - **Data management**: UL/DL + remote (multi-) file browsing
 - **Integration** with interactive apps
- **End-user oriented focus!**
 - application integration

3-Tier Computing Portal with EnginFrame



Industrial Grid Portals

The image displays three overlapping web browser windows from the early 2000s, illustrating industrial grid portals. The top-left window is titled "EnginFrame Services in STMicroelectronics - Microsoft Internet Explorer" and shows the STMicroelectronics logo and navigation links like "Home", "Your jobs", "Your data", "Support", and "Logout". The middle window is "Ferrari Datagate - Internal Users Area", featuring the Ferrari logo and a "Service offerings" menu with links to "List Incoming Files", "List Outgoing Files", and "Submit file". The bottom-right window is "Audi World Site - News - Microsoft Internet Explorer", showing the Audi logo and a form for "Audi Pamcrash_preprocessed" with fields for "LSF hosts", "Projektname", "Berechnungsfall", "Input Deck", and "Pamcrash Version".

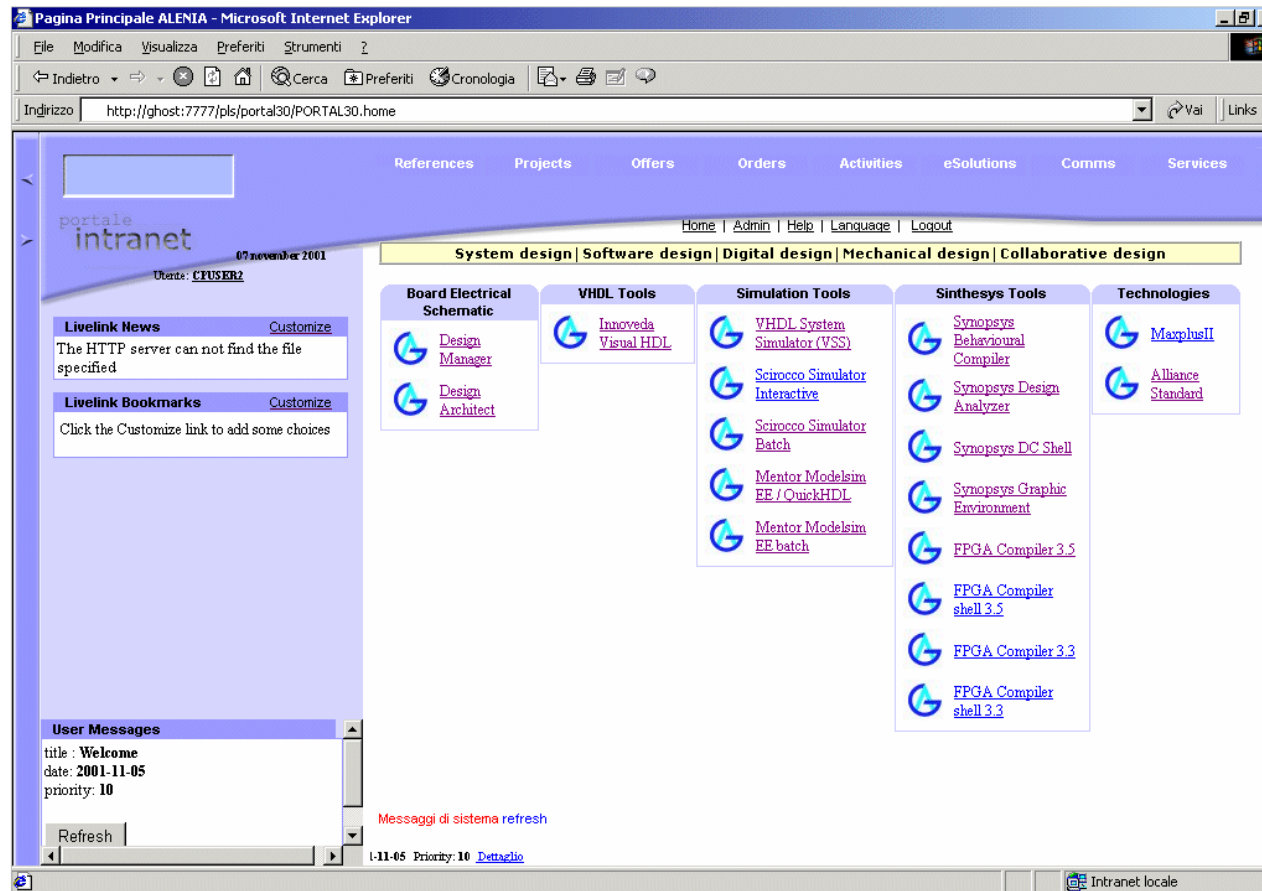
Black-box Grid solutions

Case study: Consolidation

Company in the Defense sector









- Different companies have merged into one
- Sites and customers spread over WAN
- Projects need common **coordination and collaboration**
 - No common design methodology
 - Duplicated licenses across different sites
 - Insufficient local resources
 - Limited communication

Solution: EnginFrame

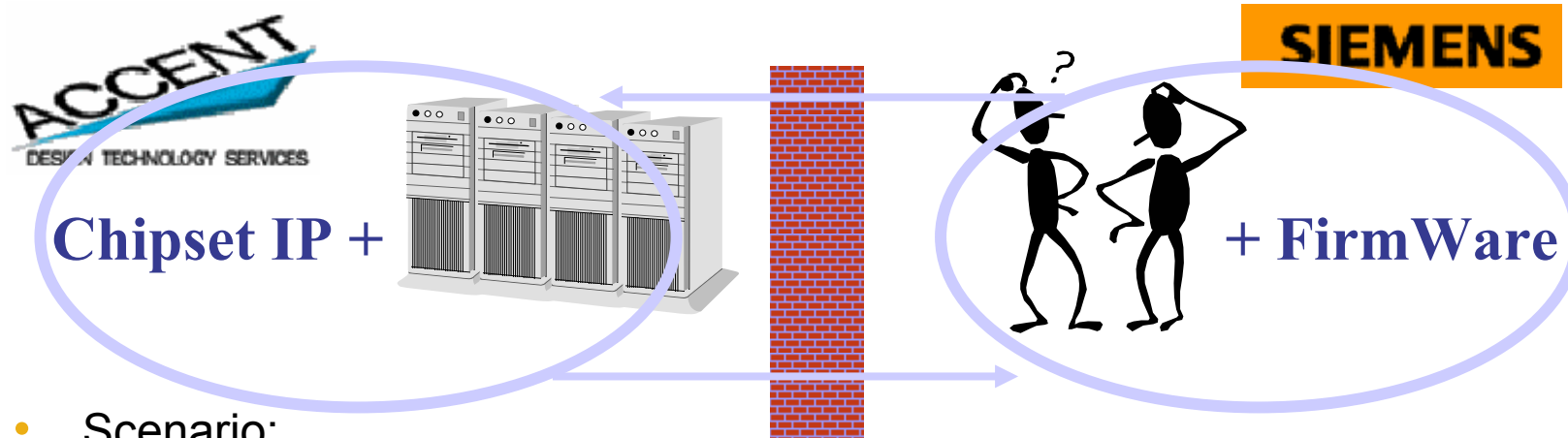


Centralized eDesign Services

EnginFrame benefits

-  IT assets and project methodology **consolidation**
-  Enhanced **collaboration** with remote sites and partners
-  **Intellectual Property protection**
 - Automatic and transparent enforcement of company **policies**
-  Wealth of properly focused information for management
-  Ease **deployment** of new software and methodologies
-  **Rapid migration** to the Computing Portal paradigm from a typical engineering environment
 - Enhance resource **Manageability** for System and Application managers
 - Enable smooth NT-UNIX-appliance **integration**
 - **Complexity reduction** for Grid environments
- 
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Case Study: Intellectual Property



- Scenario:
 - Accent is designing a chipset for Siemens
 - Siemens needs to test the firmware & software for this chipset
- Problem:
 - Intellectual Property cannot be disclosed

Solution: EnginFrame

The image shows two overlapping web browser windows. The background window is titled "EnginFrame Services in STMicroelectronics - Microsoft Internet Explorer". It features the ST logo and a navigation menu with links for "Home", "Your jobs", "Your data", "Support", and "Logout". The main content area is titled "Dante Remote Simulation" and includes a small portrait of Dante Alighieri. Below the portrait, there is a welcome message and a section titled "Some Points To Note Before Beginning" which lists instructions for login, a note about simulator idleness, and job submission details.

The foreground window is titled "Accent Corporate Portal - Microsoft Internet Explorer". It features the Accent logo and a navigation menu with links for "Computing services", "Your jobs", "Your data", "Your balance", "Statistics", "Support", and "enginframe". The main content area is titled "How to submit new sims" and provides instructions on how to submit a new simulation, including the requirement for compiled ROM and Flash Memory files. It lists the following file naming conventions:

Your ROM data file	=>	O8L4096X32M16TH1.cde
Your Flash memory data file	=>	flash_mem_file

Below the instructions, it states: "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 Firmware simulation

EnginFrame benefits

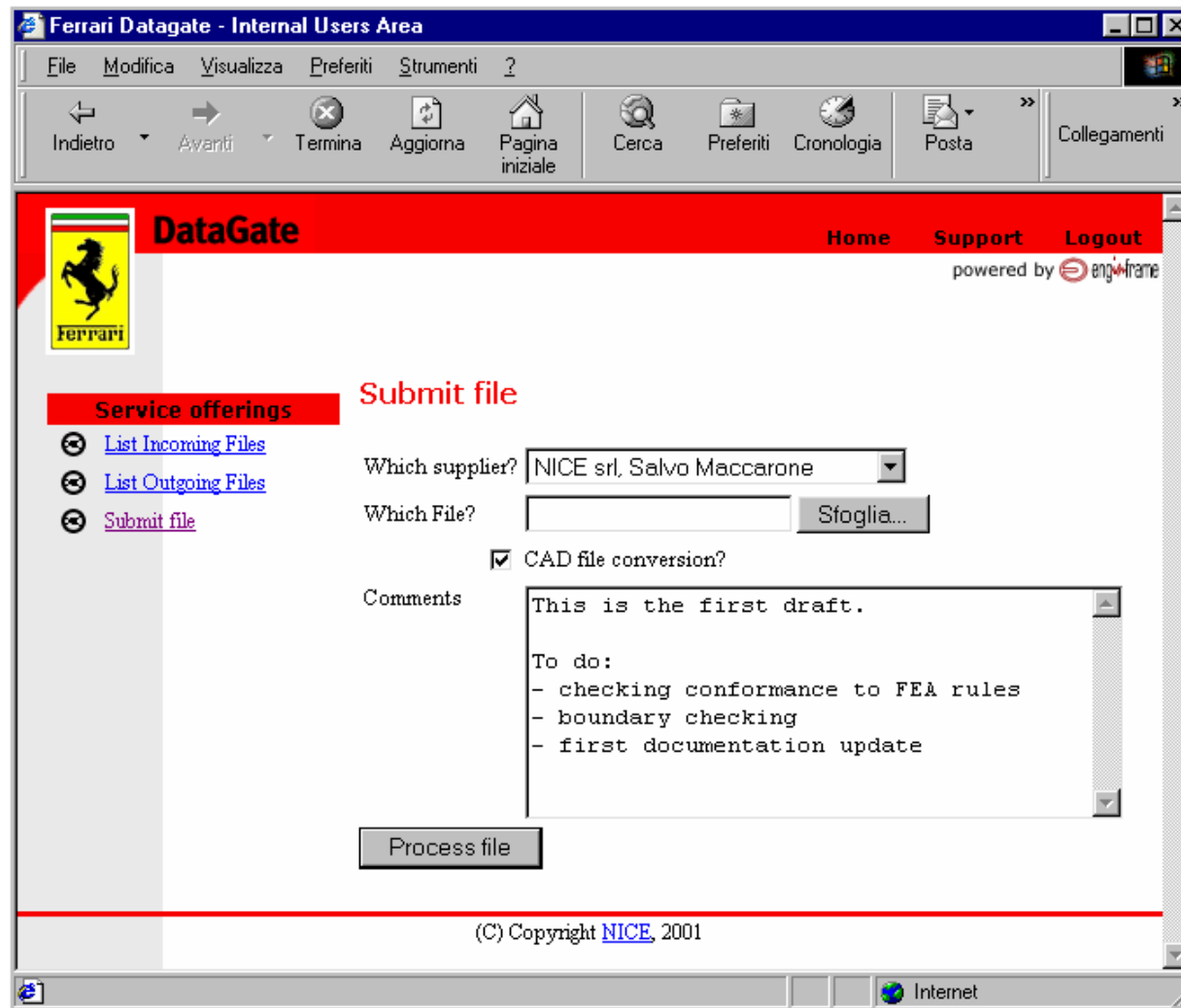
- ☺ IT assets and project methodology **consolidation**
- ☺ Enhanced **collaboration** with remote sites and partners
- ☺ **Intellectual Property protection**
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- ☺ Enable smooth NT-UNIX-appliance **integration**
- **Complexity reduction** for Grid environments

Case Study: Data Exchange


Collaboration problem in the supply chain

- Many suppliers with different supported 3D models
- Complex operations to convert files
- Management not comfortable with uncontrolled data exchange
- User friendliness

Solution: EnginFrame DataGate



EnginFrame benefits

-  IT assets and project methodology **consolidation**
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- 

Typical GENIUS installation (1/3)

- To install GENIUS on an User Interface machine you need a server certificate (in order to sign https connection) and a free EnginFrame license
- The user **efadmin** must be present in the system
- GENIUS is downloaded from a SSH CVS server
- GENIUS should be installed under **/opt/genius**
- GENIUS installs with **/opt/genius/genius_install.sh** (just one command!)
- GENIUS starts/stops with the command **/etc/rc.d/init.d/genius start|stop**

Typical GENIUS installation (2/3)

- `ls -l /opt/genius`

```
drwxr-xr-x  2 root  root    4096 Apr 15 13:19 CVS
drwxr-xr-x  8 nobody nobody  4096 Apr 15 13:19 JSDK2.0
drwxr-xr-x 18 root  root    4096 Apr 15 13:20 apache
drwxr-xr-x  3 root  root    4096 May  3 16:47 bin
drwxr-xr-x 17 root  root    4096 Apr 15 13:20 ef
lrwxrwxrwx 1 root  root    36 Apr 15 13:21 etc -> /opt/genius/ef/plugins/infngrid/etc/
-rwxr-xr-x  1 root  root   4512 Oct 14 2003 genius_install.sh
drwxr-xr-x  4 root  root    4096 Apr 15 13:20 include
drwxr-xr-x  9 root  root    4096 Apr 15 13:20 j2sdk1.4.0_01
lrwxrwxrwx  1 root  root     13 Apr 15 13:21 jdk -> j2sdk1.4.0_01
lrwxrwxrwx  1 root  root     7 Apr 15 13:21 jsdk -> JSDK2.0
drwxr-xr-x  4 root  root    4096 Apr 15 13:20 lib
drwxr-xr-x  5 root  root    4096 Apr 15 13:20 man
drwxr-xr-x  7 root  root    4096 Apr 15 13:20 mrtg
drwxr-xr-x  9 root  root    4096 Apr 15 13:20 openldap
drwxr-xr-x  8 root  root    4096 Apr 15 13:20 openssl
drwxr-xr-x  4 root  root    4096 May  5 11:10 vnc
```

Typical GENIUS installation (3/3)

- Configuration files
 - `/opt/genius/etc`
- XML files
 - `/opt/genius/apache/htdocs`
- Action procedures (shell scripts, etc.)
 - `/opt/genius/ef/plugins/infnggrid/bin`
- Third-party binaries (PHP4, OpenSSL, TightVNC, expect, ...)
 - `/opt/genius/bin`

Service Example

```
<ef:service id="gzip">  
  <ef:name>gzip sample</ef:name>  
  <ef:option id="level" label="Compression level" type="list">  
    <ef:option id="9">maximum</ef:option>  
    <ef:option id="4">medium</ef:option>  
    <ef:option id="0">none</ef:option>  
  </ef:option>  
  <ef:option id="FILE" label="File to compress" type="file"/>  
  <ef:action id="submit" label="Submit job">  
    EF_SPOOLER_NAME="gzip $file"  
    export EF_SPOOLER_NAME  
    ${EF_ROOT}/plugins/lsf/bin/bsub -o output.txt gzip -$level \"$FILE\"  
  <ef:result type="text/xml"/></ef:action>  
</ef:service>
```

The screenshot displays a web-based user interface for the 'gzip' service. On the left, a sidebar contains several navigation links: 'gzip samples', 'Simple test', 'Choice test', '<embed> test', 'Execute command', and 'View the source'. The main content area features a form with the following elements: a 'Compression level' dropdown menu currently set to 'maximum', a 'File to compress' text input field with a 'Sfoglia...' button, and a 'Submit job' button. The interface also includes a status bar at the bottom showing 'Operazione completata' and 'Internet'. The copyright notice '© Copyright NICE srl, 1998-2001' is visible in the bottom right corner of the main content area.

Choosing the right layout

- One very effective method is to select one existing page from your Intranet/Internet site
- You need to identify a page where you can figure out the space for the service navigation bar and the service content area

The image displays two web browser screenshots side-by-side, illustrating the process of identifying layout elements for a service. The left browser window, titled "Remote Agent demonstration - Microsoft Internet Explorer", shows a page with a red navigation bar containing "enginframe", "local", "remote", "LSF", "job", and "logout". Below this is a "gzip sample" form with fields for "Compression level" (set to "maximum") and "File to compress", and a "Submit job" button. A green box highlights a vertical list of links on the left: "gzip samples", "Simple test", "Choice test", "<embed> test", "Execute command", and "View the source". The right browser window, titled "Welcome to GENIUS 1.4 - Netscape", shows a portal with logos for "enginframe", "genius", and "Data GRID". A navigation menu on the left lists "File Services", "Security Services", "Job Services", "Info Services", "Monitoring Services", "Interactive Services", "VO Services", "Statistics", and "Logout GENIUS". A blue box highlights a central content area containing "Welcome to GENIUS 1.4", a "NEW GENIUS User's Guide" link, "GENIUS FAQs", "GENIUS Mailing List", "GENIUS Mailing Archive", "Useful Links", and "Credits". Green lines connect the highlighted areas between the two browsers, showing how the layout of the demonstration page is being analyzed to fit into the main portal's structure.

FAQ's...and answers (1/2)

- **Q:** I want to use GENIUS. Do I have to pay for it ?
- **A:** No. GENIUS is “open source” and the underlying portal framework EnginFrame is **free** for education and research communities.

- **Q:** I want to use GENIUS. Do I need any software running on my laptop ?
- **A:** No client software needs to be installed apart from the web browser. GENIUS can really be accessed from everywhere.

- **Q:** Do I have to be afraid about cached password sent over the web ?
- **A:** Access passwords are securely “streamed” only when needed and then destroyed. Only temporary sessions are possible.

- **Q:** Can new authentication methods implemented into GENIUS ?
- **A:** Of course. Kerberos V is a good example. EnginFrame is compliant with Kerberos authentication and GENIUS with AFS.

FAQ's...and answers (2/2)

- **Q:** I want to add a new VO to GENIUS and customize new services for that VO. How can I do that ?
- **A:** A new VO can be added to GENIUS in just minutes. New VO specific services can be added just modifying only two files: an XML file and a shell script.

- **Q:** Can I use GENIUS to interface other m/w's ?
- **A:** Yes. Although GENIUS is currently based on the DataGrid middleware(w/ and w/o GLUE extensions), it can be very easily interfaced to others. A direct interface to the Globus Toolkit already exists and another one to Condor is in progress.

- **Q:** How can I start downloading/using GENIUS ?
- **A:** Go to the reference site <https://genius.ct.infn.it>, click on "GENIUS CVS available" and follow the instructions.