Bulgarian Induction to GRID Computing and EGEE project,
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User Interface.
Possible ways for deploying UI.
How to use virtual machine UI.

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Information Society
and Media

Enabling Grids for E-sciencE

- **What is a User Interface (UI) ?**

- **What are the possible ways of deploying a UI**

- **Hands on deploying a Virtual Machine (VM) UI**
  - **How to deploy VM based preconfigured UI**
  - **Where and how to put certificate and private key**
  - **Basic requirements to be met – firewall, NAT, ntp**

- **Checking the functionality of the VM UI**
  - **How to check important settings**

The User Interface (UI) is the 'gateway to the GRID resources'. This can be any machine where users have a personal account and where their user certificate is installed. From a UI, a user can be authenticated and authorized to use the EGEE resources, and can access the functionalities offered by the Information, Workload and Data management systems. It provides CLI tools to perform some basic Grid operations:
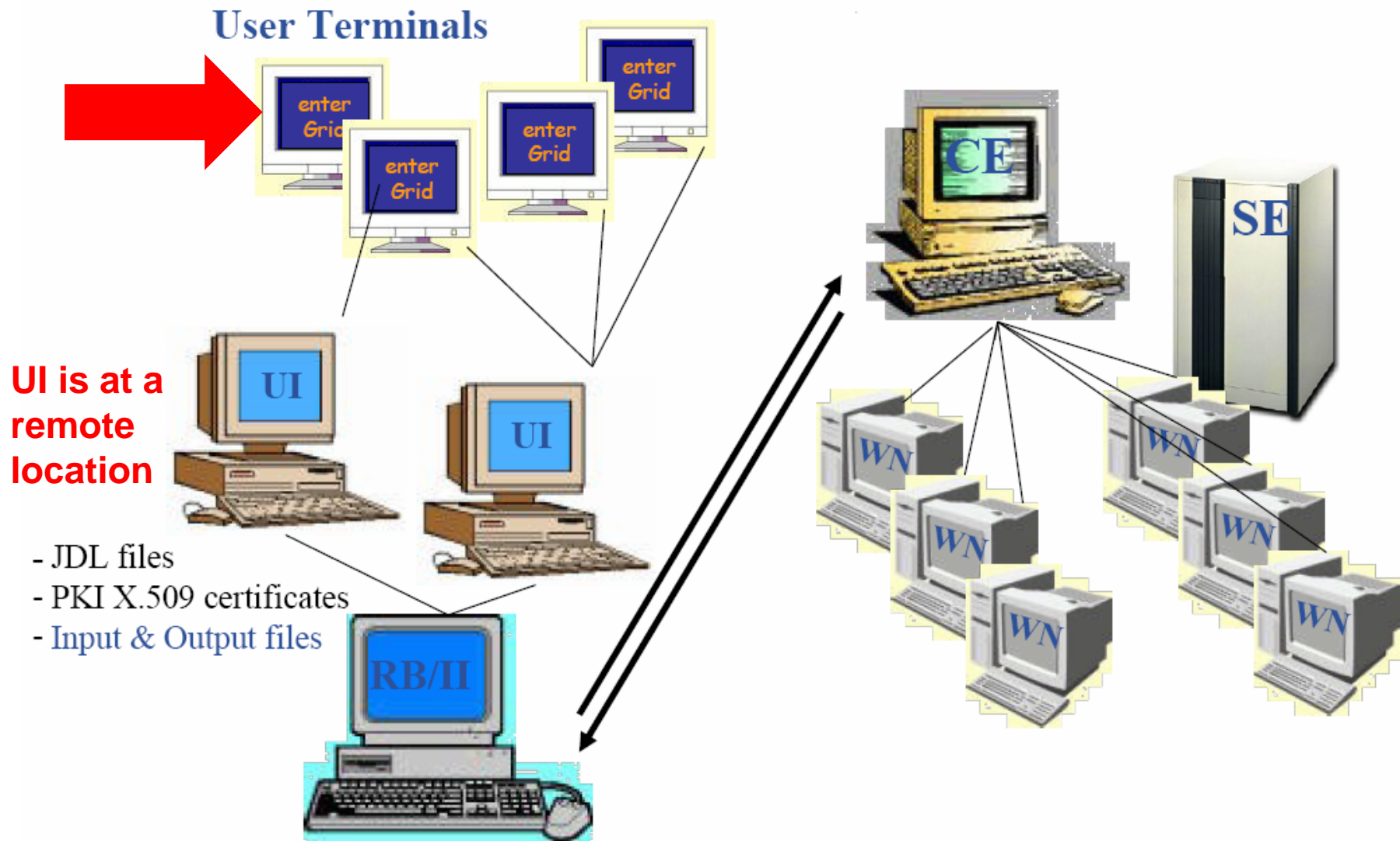
- list all the resources suitable to execute a given job;
- submit jobs for execution;
- cancel jobs;
- retrieve the output of finished jobs;
- show the status of submitted jobs;
- retrieve the logging and bookkeeping information of jobs;
- copy, replicate and delete files from the Grid;
- retrieve the status of different resources from the Information System.

- In addition APIs are also available on the UI to allow development of Gridenabled applications.
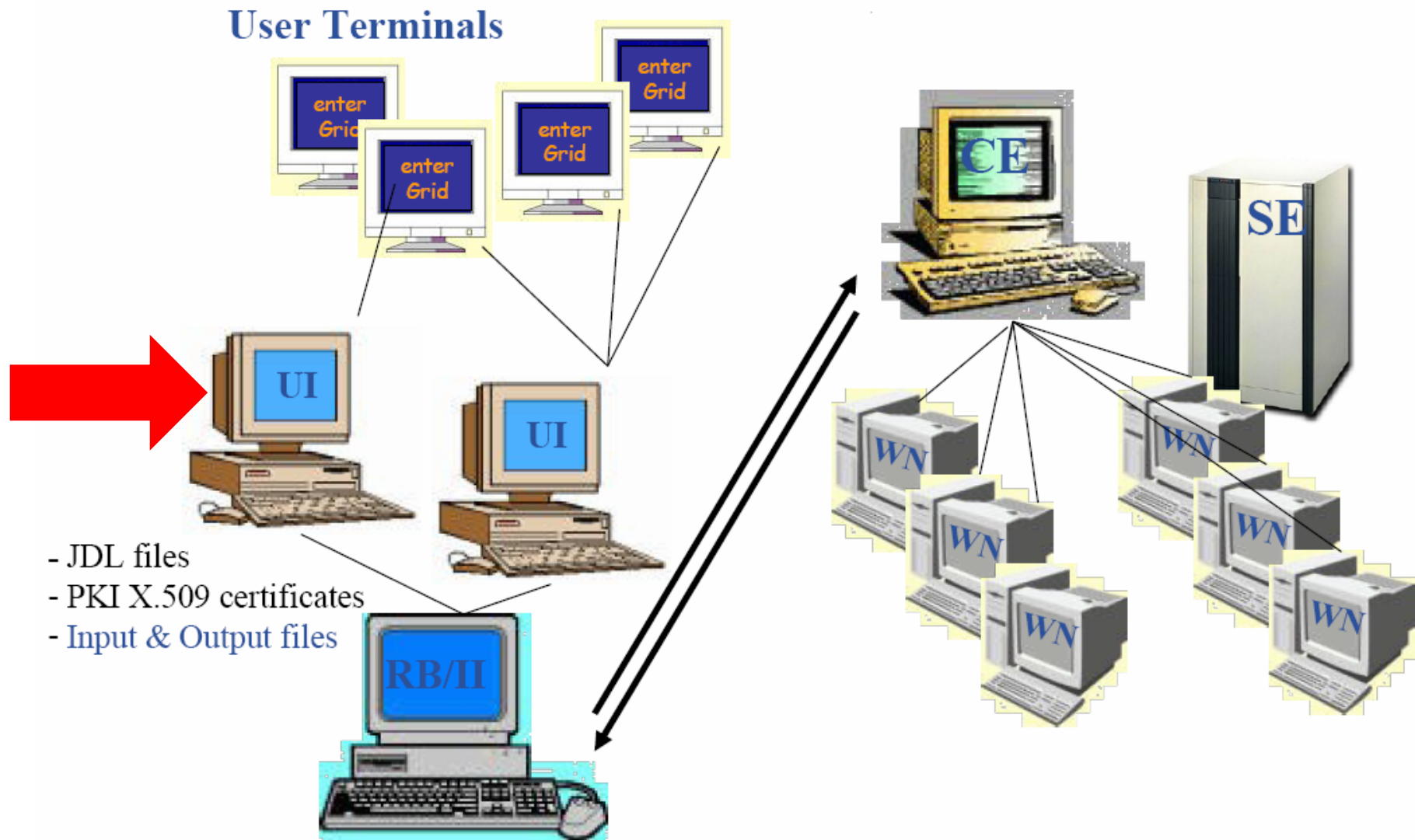
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- **The UI is a suite of clients and API that users and applications can use to access the gLite services**

- **The gLite UI includes the following components:**

  - **VOMS command-line tools**
  - **Workload Management System clients and APIs**
  - **Logging and Bookkeeping clients and APIs**
  - **Data Transfer command-line clients and APIs**
  - **Data Catalog command-line clients and APIs**
  - **gLite I/O client and APIs**
  - **R-GMA client and APIs**

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- **1. Obtain a Cryptographic X.509 certificate from a Certification Authority (CA) recognized by EGEE;**

  Current Certificate Authority (CA) for Bulgarian users is

  SeeGrid CA

  but

  BG.ACAD CA – the Bulgarian grid and Academic CA is in the process of being established

- **2. Join a suitable Virtual Organization;**

What are the Available possibilities

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- **Have a user account at a Remotely accessible UI**
  - **It can be provided by a site or a VO and is maintained by the site or VO administartors**
  - **From user's point of view:**
    - **NO administrative overhead**
    - **Less control and flexibility**
- **Have a locally installed linux machine that is configured to be UI**
  - Cumbersome setup (spare machine, firewall problems, available IP address)
  - Support deployed by oneself
  - Great for learning
  - In rare occasions it could happen that the remote UI is down (for maintenance) or unreachable for some reson – it is a 'spare'
- **Have a locally run readily prepared (by site or VO admins) and regularly updated Virtual Machine or LiveCD based UI:**
  - Less administrative overhead (but still not completely eliminated)
  - Great flexibility

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User Terminals

enter Grid

enter Grid

enter Grid

enter Grid

enter Grid

CE

SE

UI is at a remote location

UI

UI

WN

WN

WN

WN

WN

WN

- JDL files
- PKI X.509 certificates
- Input & Output files

RB/II

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- **Standalone** →administrated by the user

  - ▪ **'Standard Setup'**

    - **User needs to have full access and administrative privileges**

  - ▪ **User space (redistributable tarball)**

- **Multiboot (essentially the same as standalone)** → also administrated by the user

- **Virtual Machine Or LiveCD** → administrated mainly by site or VO admins but with the possibility for complete user intervention – (which can be a nightmare for User support ☹)

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- **The art of virtualisation or why a Virtual Machine ?**
  - User does not have a spare machine and doesn't want to do the multiboot 'limbo'
  - User does not want to mess up his current Linux installation;
  - User is using M$ Windows
  - User has the possibility to simultaneously work on a Multi-OS environment
  - User wants complete control over the UI system

- **However,**
  - This setup requires more powerfull hardware

All of these offer the possibility to host a Virtual Machine (guest) :

- **Vmware Linux, windows**
- **Qemu –multiplatform (Apple MAC too)**
- **Usermode linux - Linux**
- **XEN 3.0 – Linux , FreeBSD**

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Hands on

Setting up a Virtual Machine UI

eGee

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For the purposes of this tutorial VMWare player has been already installed on your workstations, however it is available for free download at:
http://www.vmware.com/products/player/

• **Start VMWare player and load the Virtual Machine that can be found at**

`C:\TEMP-GILDA\VM-UI`

Look for "GILDAVM_Base.vmx" file – it actually contains the configuration of the VM.
If it is the first time you start this VM on this particular host – you will get a dialog : "The location of this virtual machine's configuration file has changed since it was last powered on."
Select "create" (it is preselected)

This Virtual Machine is updated and slightly modified to adapt to this tutorial
You can get the original Virtual Machine image at:

https://gilda.ct.infn.it/UIVM/gLite-UI-VM3.0.tar.gz

It contains a SLC 3.0.6 installation configured for a UI

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Input is toggled with the key combinations 'Ctrl+G' and 'Ctrl+Alt'

To direct input to the virtual machine - press 'Ctrl+G' (or mouse-click in the VMWare Player Window)

To stop input to the virtual machine – press 'Ctrl-Alt'

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- **First thing to do – login as `root` and then change available users' passwords**
- **Change passwords:**

  Current passwords are:

  > *user: root*
  > *Password: root-gilda*

  > *user: gildauser*
  > *Password: user-gilda*

To change passwords:

Login as `root` and then:

`>passwd`

> *(follow instructions …)*

`>passwd gildauser`

> *(follow instructions …)*

- **Reconfigure your network if necessary –**

  From VMWare Player's network dropdown menu select the desired network – NAT works, but has problem with NFS, better use "bridged" but that needs another public IP address:

  ```
  >service network stop
  >netconfig
  ```
  (select DHCP or manually configure IP)

  Now suspend the virtual machine - I found it necessary if you change the type of network setup from VMWare Player's network dropdown menu.

  ```
  >service network start
  ```

```
>chkconfig --list
```

check for services that you KNOW that you will not use

i.e. consider whether you want remote access to your local UI :

To stop sshd :

```
>service sshd stop
>chkconfig sshd off
```

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To update the OS →

Ensure you have network connectivity and then:

```
>apt-get update
>apt-get dist-upgrade
```

If you want to upgrade to the latest kernel:

```
>apt-get upgrade-kernel
>reboot
```

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- **Imperative requirement for the gLite nodes is that they are synchronized.**
- **Check for time synchronization:**

- **Configure the file `/etc/ntp.conf` by adding the lines dealing with your time server configuration such as, for instance:**

```
# Prohibit general access to this service.
restrict default ignore
restrict 194.141.0.11 mask 255.255.255.255
  nomodify notrap noquery

server  127.127.1.0      # local clock
fudge   127.127.1.0 stratum 10
server poseidon.acad.bg
```

- **Edit the file `/etc/ntp/step-tickers` adding a list of your time server(s) hostname(s)**

```
cat /etc/ntp/step-tickers
193.206.144.10
```

- **# If you are running a kernel firewall, you will have to allow inbound communication on the NTP port.**
- **If you are using iptables, you can add the following to `/etc/sysconfig/iptables`**

```
-A INPUT -s <NTP-serverIP-1> -p udp --dport
123 -j ACCEPT
```

- **You can then reload the firewall :**

```
service iptables restart
```

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- **Activate the ntpd service with the following commands:**

```
# service ntpd stop

# ntpdate <your ntp server name>
            ie  194.141.0.11

# service ntpd start

# chkconfig ntpd on
```

- **You can check ntpd's status by running the following command :**

```
# ntpq -p
```

UI Testing

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Now start putty shortcut to gilda tutor from your windows desktop and note which gilda tutor user are you logged in as, ie the prompt is:

```
[sofia09@glite-tutor sofia09]$
```

That would mean you are user `sofia09` Remember it.

Note that for this tutorial each one of the machines has its own user and password (case sensitive !):

usernames → sofia01....25
passwords → GridSOF01....25
certificate passphrase is the same for all → SOFIA

Now >`exit` and
login as user `gildauser` or as root execute:
>`su - gildauser`

Copy the certificates from the remote UI to the Virtual Machine (using the VM) :

>`cd /home/gildauser/.globus`
>`scp -p sofiaxx@glite-tutor.ct.infn.it:/home/sofiaxx/.globus/*.pem ./`

•**Verify permissions of the certificates; they must be:**
>`ls -la`

```
-rw-r--r--  1 gildauser gildauser 1127 Jun 14 12:27 usercert.pem
-r--------  1 gildauser gildauser 887  Jun 14 12:28 userkey.pem
```

•**If file permissions are wrong use:**
> `chmod 400 userkey.pem`

> `chmod 644 usercert.pem`

egee

Now check:

```
>lcg-infosites --vo gilda ce
```

Create proxy:

```
>voms-proxy-init --voms gilda
>voms-proxy-info -all
```

You could try and work on the Virtual Machine for the next exercises !

- **gLite v3.0 Advanced Installation and Configuration Guide**

  http://glite.web.cern.ch/glite/packages/R3.0/R20 060502/doc/installation_guide_3.0-2.html

- **How to install a TAR UI**

  https://uimon.cern.ch/twiki/bin/view/LCG/TarUIInstall

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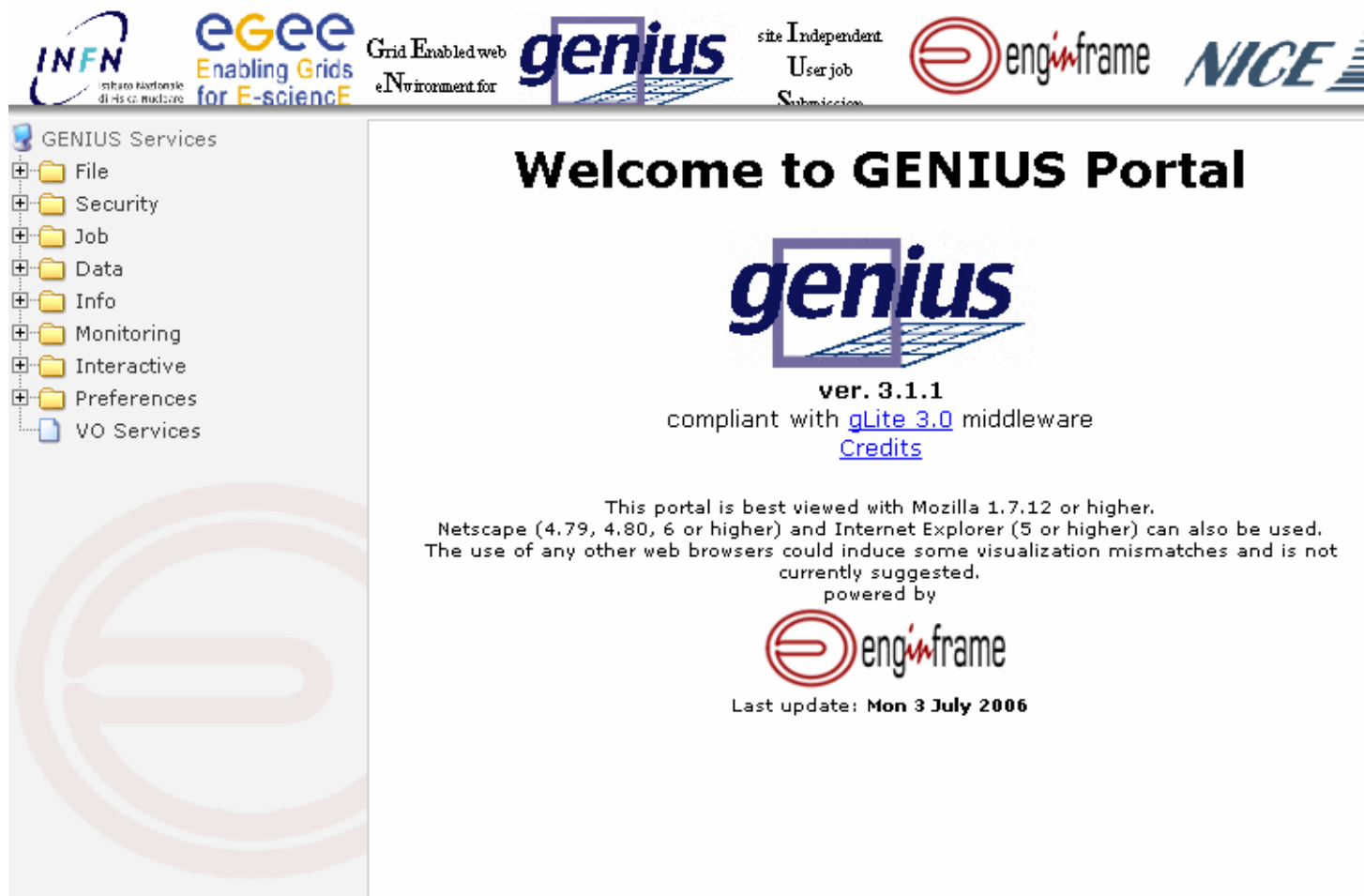
There exist another variation of User Interface –
Web based GUI

User's heaven ???

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- **GENIUS Portal**

  http://genius.ct.infn.it

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- **P-GRADE portal**

  http://portal.p-grade.hu

  http://portal.ipp.acad.bg – currently in deployment

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