Interactive Jobs with gLite

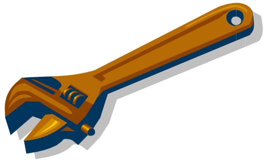
Giuseppe La Rocca
INFN Catania - Italy

NA4 Generic Applications Meeting
09-11.January.2006

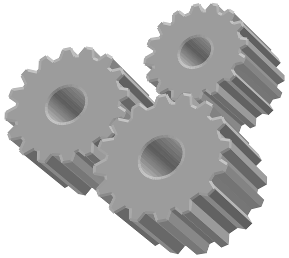
www.eu-egee.org

Outline

- What is Interactive job ?
  - Requirements & Settings



  - Options



- How to create an interactive job
- Submit Interactive Job in LCG and gLite
- CYCAS@work!

What is a Interactive Job ?

- **Interactive jobs opens a real time connection with the job standard streams and allow direct interaction with it.**

- **When an interactive job is submitted starts, in background, a grid console shadow process that listens on a port for the job standard streams.**

- **The port on which the shadow process listens is assigned by the OS, but can be forced using a JDL's attributes.**

Requirements & Settings

- As the job opens a X Window, the following settings MUST BE satisfied:
  - X Server must be up and running in the local machine.
  - the DISPLAY environment variable must be correctly set

    (e.g. export DISPLAY=193.206.208.68:0.0)
  - Permission for Outbound Connectivity
    - GlueHostNetworkAdapterOutboundIP = TRUE

Requirements & Settings

- Add host name to the list allowed to make connections to the X Server:

```
xhost +
```

- Enable the firewall of the local machine as follow:

```
-A RH-Firewall-1-INPUT –m state --state NEW
  –m tcp –p tcp –dport 6000 –j ACCEPT
```

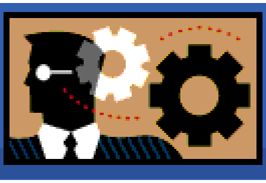
Requirements & Settings

- If user is connected to the UI node from remote machine (e.g. with ssh) **secure X11 tunneling** must be enabled.

- Add the following settings to **/etc/ssh/ssh_config** file.

```
ForwardX11 yes
ForwardX11Trusted yes
```

- Restart the server with **service sshd restart**



Options

- If X11 tunneling cannot be enabled, the user can try to submit the interactive job using the ***--nogui*** option that allow to interact with running job without a graphical interface.

- With the ***--nolisten*** option the job standard streams, coming from the WN, are forwarded on the UI to **named pipes** whose name are returned to the user together with the *OS Id* of the *listener process*. In this case the listener process must to be killed by the user.

How to create an Interactive Job

InterCYCAS.jdl

- We can create a simple interactive job by setting **JobType** to “*Interactive*”.

```
[
  JobType = “Interactive”;

  Executable = “startCYCAS.sh”;
  Arguments = “borneo_3d.cyc”;

  InputSandbox = {"startCYCAS.sh","borneo_3d.cyc"};
  OutputSandbox = "borneo_3d.cyc";
```

Enabling Grids for E-sciencE

InterCYCAS.jdl

```
//grid_console_shadow listens on this port. If not specified is assigned by the OS.
ListenerPort = 21000;

Requirements=
(Member("GLITE-1.4",other.GlueHostApplicationSoftwareRunTimeEnvironment)) &&
(Member("CYCAS-3.20",other.GlueHostApplicationSoftwareRunTimeEnvironment)) &&
(Member("POVRAY-3.5",other.GlueHostApplicationSoftwareRunTimeEnvironment)) &&
(other.GlueHostNetworkAdapterOutboundIP == TRUE);
]
```

This is an integer (21000-25000) that represents the port on which the grid_console_shadow process starts to listen for the job standard streams.

It MUST BE unique!

startCYCAS.sh

- The script executed on the WN is the following one:

```
#!/bin/sh
# Export DISPLAY environment to a remote machine.
export DISPLAY=193.206.208.68:0.0

# Define the input file used for rendering by CYCAS.
CYCAS_INPUT_FILE=$1
LOCAL_DIR=`pwd`

echo "Welcome! This is a simple interactive job."; echo
echo "About CYCAS.“ [..]

echo "Do you want to start CYCAS (y/n) ? [Y]:"
```

startCYCAS.sh

```
read ANS
   case ${ANS} in
         Y | y)
                  #Launch the application.
                  cd /usr/local/cycas3
                  ./cycas.real ${LOCAL_DIR}/${CYCAS_INPUT_FILE} ;;
         *)
                  echo "Have a nice day!" ;;
   esac

echo "That's all folks!!
```

Submit an Interactive Job

- **The command sequence to submit this example is this one:**

```
voms-proxy-init --voms gilda
```

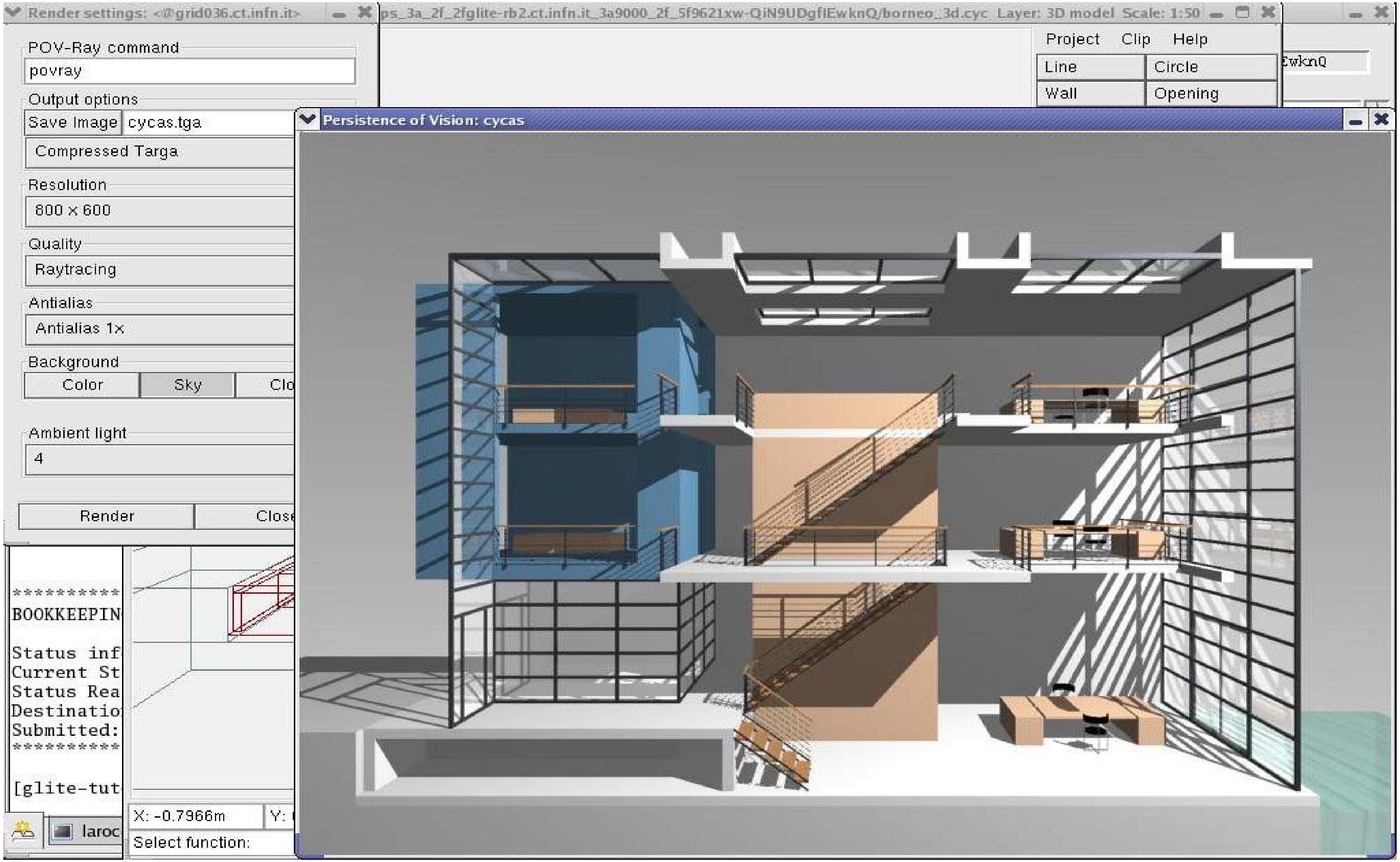
```
edg-job-submit interactive.jdl
edg-job-status <JobID>
```

```
glite-job-submit interactive.jdl
        glite-job-status <JobID>
```

About CYCAS

- CYCAS is a piece of architectural software for drafting and design in 2 or 3 dimensions.
- In addition to typical CAD functions, CYCAS offers special elements and techniques for architectural design.
- CYCAS exports its 3D data in various formats in order to pass these data on to software for creating computer based graphics.

CYCAS @ work !



Render settings: <@grid036.ct.infn.it>

POV-Ray command: povray

Output options: Save Image cycas.tga

Compressed Targa

Resolution: 800 x 600

Quality: Raytracing

Antialias: Antialias 1x

Background: Color Sky Clo

Ambient light: 4

```
**********
BOOKKEEPIN

Status inf
Current St
Status Rea
Destinatio
Submitted:
**********

[glite-tut
```

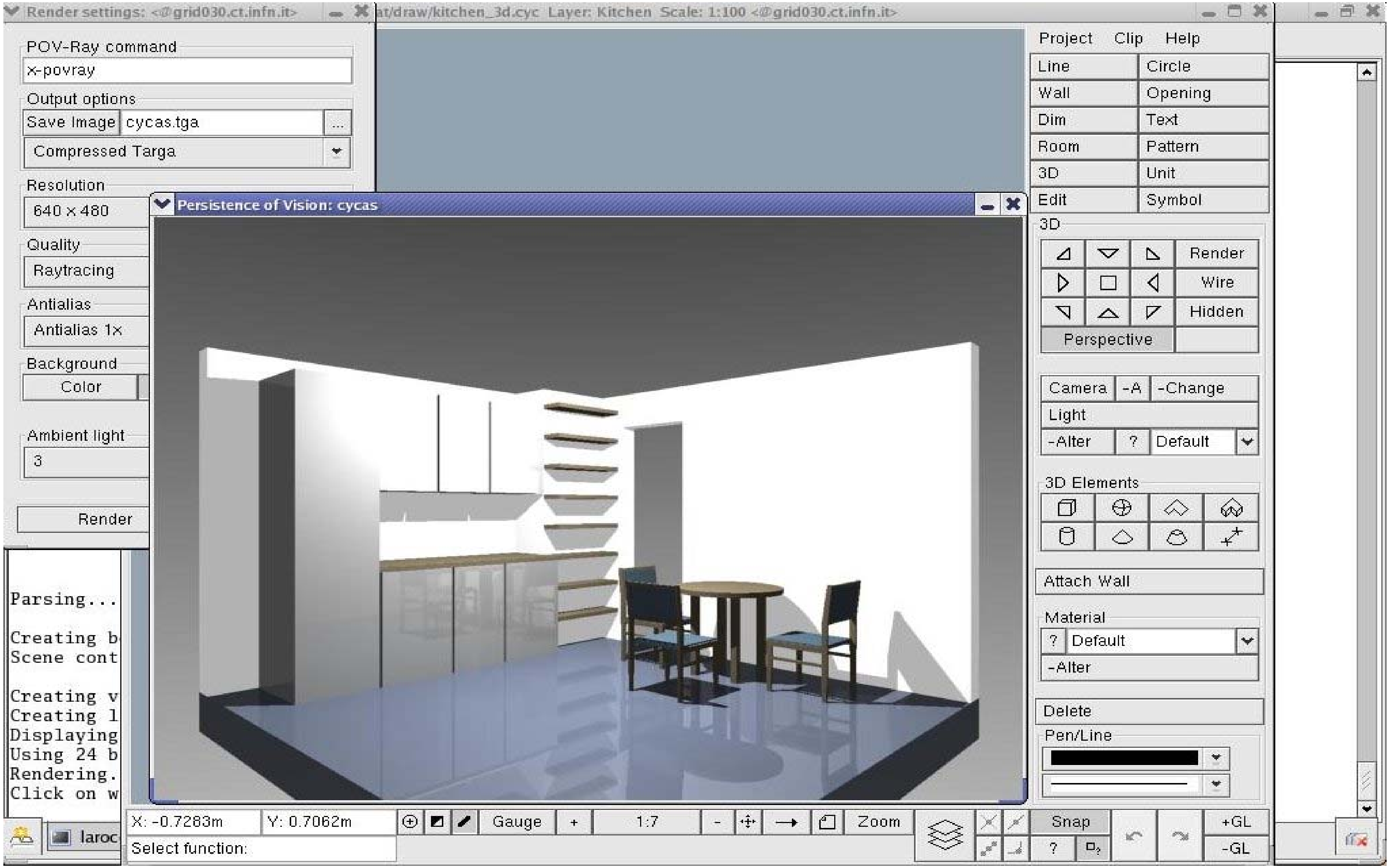
ps_3a_2f_2fglite-rb2.ct.infn.it_3a9000_2f_5f9621xw-QiN9UDgflEwknQ/borneo_3d.cyc Layer: 3D model Scale: 1:50

X: -0.7966m Y:

Select function:

Persistence of Vision: cycas

CYCAS @ work !



Render settings: <@grid030.ct.infn.it>

POV-Ray command: x-povray

Output options: Save Image cycas.tga

Compressed Targa

Resolution: 640 x 480

Quality: Raytracing

Antialias: Antialias 1x

Background: Color

Ambient light: 3

at/draw/kitchen_3d.cyc Layer: Kitchen Scale: 1:100 <@grid030.ct.infn.it>

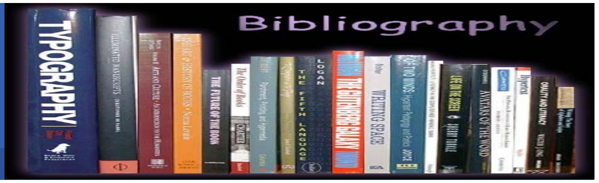
Persistence of Vision: cycas

```
Parsing...

Creating b
Scene cont

Creating v
Creating l
Displaying
Using 24 b
Rendering.
Click on w
```

X: -0.7283m

Y: 0.7062m

Select function:



- **LCG-2 User Guide Manuals Series**
  - https://edms.cern.ch/file/454439/LCG-2-UserGuid.pdf

- **gLite WMS's User Guide**
  - https://edms.cern.ch/document/572489/1

- **JDL Attributes**
  - http://egee.cesnet.cz/export/sites/egee/voce/JDL_Attributes_DataGrid.pdf

- **About CYCAS**
  - http://www.cycas.de/index.html

Questions…