CrossGrid testbed status

Ariel García

The EU CrossGrid Project

1 March 2002 – 30 April 2005

Main focus on interactive
and parallel applications

People

First Prototype of the CrossGrid Testbed

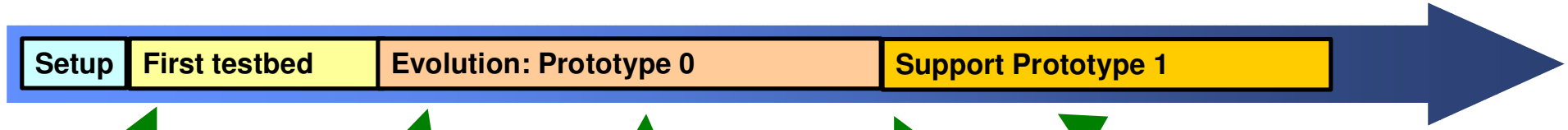
J.Gomes[1], M.David[1], J.Martins[1], L.Bernardo[1], J.Marco[2], R.Marco[2], D.Rodríguez[2], J.Salt[3], S.Gonzalez[3], J.Sánchez[3], A.Fuentes[4], M.Hardt[5], A.García[5], P.Nyczyk[6], A.Ozieblo[6], P.Wolniewicz[7], M.Bluj[8], K.Nawrocki[9], A.Padee[8,9,10], W.Wislicki[8,9], C.Fernández[11], J.Fontán[11], A.Gómez[11], I.López[11], Y.Cotronis[12], E.Floros[12], G.Tsouloupas[13], W.Xing[13], M.Dikaiakos[13], J.Astalos[14], B.Coghlan[15], E.Heymann[16], M.Senar[16], G.Merino[17], C.Kanellopoulos[18], and G.D.van Albada[19]

[1] Laboratório de Instrumentacão e Física de Partículas, Lisbon, Portugal
[2] Instituto de Física de Cantabria (CSIC),Santander, Spain
[3] Instituto de Física Corpuscular(CSIC),Valencia, Spain
[4] RedIris(CSIC),Madrid, Spain
[5] Forschungszentrum Karlsruhe GMBH, Germany
[6] Akademickie Centrum Komputerowe CYFRONET, Krakow, Poland
[7] Poznan Supercomputing and Networking Center, Poznan, Poland
[8] A.Soltan Institute for Nuclear Studies, Warsaw, Poland
[9] Interdisciplinary Centre for Mathematical and Computational Modelling, University of Warsaw,Poland
[10] Instytut Radioelektroniki PW, Warsaw, Poland
[11] CESGA, Centro de Supercomputacion de Galicia, Santiago de Compostela, Spain
[12] National Center for Scientific Research "Demokritos", National and Kapodistrian University of Athens, Dep. of Informatics and Telecommunications, Greece
[13] University of Cyprus, Cyprus
[14] Ustav Informatiky Slovenska Akademia Vied, Bratislava, Slovakia
[15] Trinity College Dublin, Ireland
[16] Universitat Autonoma de Barcelona, Spain
[17] Institut de Fisica d'Altes Energies, Barcelona, Spain
[18] Aristotle University of Thessaloniki, Greece
[19] Universiteit van Amsterdam, Netherlands

CrossGrid Workpackages

- WP1 – CrossGrid Application Development
  - 1.1 - Interactive simulation and visualization of a biomedical system
  - 1.2 - Flooding crisis team support
  - 1.3 - Distributed data analysis in HEP
  - 1.4 - Weather forecasting and air pollution modeling
- WP2 – Grid Application Programming Environment
- WP3 – New Grid Services and Tools
- WP4 – International Testbed Organization
- WP5 – Project Management

Software Integration and Releases



Basic middleware

Validation TB

Integration of CrossGrid software

Dev TB

Test and validation

Validation TB

Deployment

Production TB

(repeat cycle)

Prototypes - 1st release

Production prototypes

Basic middleware
EDG 1.4.3 Globus 2

CORE WP4

I Team

- Development tools
  - MPI verification
  - Benchmarking
  - Performance prediction
  - Monitoring
- Middleware:
  - RAS, Portal, Migrating Desktop
  - Parallel Interactive Scheduler
  - Monitoring
  - Data Access Optimization
- Application Prototypes

CrossGrid Integration Team

- WP2 + WP4 people
- WP3 + WP4 people
- WP1 + WP4 people

WP2 tools

- MARMOT – Tool for MPI app debugging
  - 1st dev release ready, C & Fortran, MPI 1.2
  - N+1 nodes (debugging server)
- Performance prediction / evaluation tools
  - Use application kernels
- GridBench – benchmarking

WP3 services

- Application Portal
- Migrating Desktop and RAS

- Resource management (MPI apps)

- Santa-G
  - Info from external sensors into R-GMA (tcpdump, snort)
- Optimization of data access

Modified RB and MPI jobs

- JDL:

  Executable=...

  JobType= mpi mpich-p4 mpich-g2

  NumCPU=16

- MPI jobs:
  - In cluster (mpich-p4)
    - on EDG 1.4 middleware – testing stage
  - Across clusters (mpich-g2)
    - Main CrossGrid goal – alpha stage
    - No private clusters
  - Across clusters (PACX-MPI)
    - Private clusters

Modified RB and MPI jobs

- **Modified RB:**
  - matchmaking (CPU resources,MPICH env)
  - script generation
  - .rsl generation
- Mpich-p4 jobsubmission:
  - in test and validation stage
- Mpich-g2 jobsubmission:
  - in alpha stage
  - avoid deadlocks and failing clusters blocking the whole job

X# Graphical Interfaces

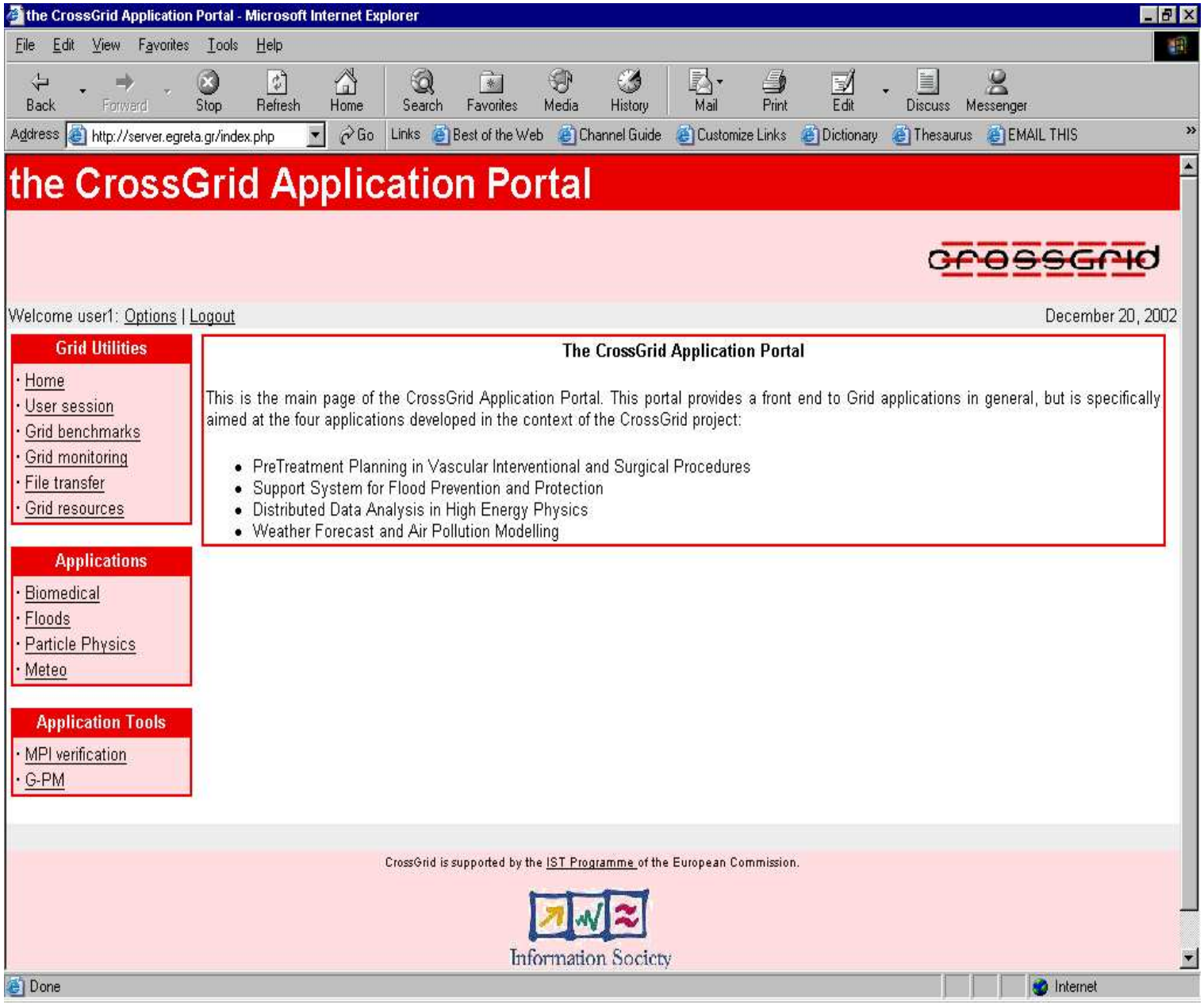
•Application Portal

- *Specific application oriented GUI*
- *Only basic GUI functionality (html,php)*
- *Usage: system without java eg. internet cafe, airport*
- *Thin client*

•Migrating desktop

- *More sophisticated user friendly Java based GUI*
- *Whole environement for grid user*
- *Possibility of working with many grids at once*
- *Integration of many Crossgrid tools*
- *Local and grid application support*
- *Local and grid file management*

Application Portal



Migrating Desktop

Integration and Release

Clear integration procedure:

- Code into CVS
- Tests in ad-hoc development TB
- Code autobuilds
- Software announced in Iteam list
- Installation in DevTB
- Request test to test & validation group (LIP)
- Tests conducted in T&V TB
- Package gets approved, announced to Iteam
- Release tagged, installation in ProdTB

Integration and release

- Integration procedure took place for
  - Modified RB
  - Santa-G
- WP4 technical work to do:
  - Nodes – services relationship
  - Security updates for EDG 1.4 (RH 6.2)
- Coding guides
- Quality control group

Comments:

- Site profiles in CVS (*)
- Common LCFG profiles (*)
  - #include "../../common/ng_source/***.h"
- Developer Workstation
  - DW = UI + Building Environment
- LCFG server amalgamation
  - LCFG + LCFGng
  - UML LCFGng servers

Partners in the CrossGrid Testbed

17 partners in
9 countries

Geant network

Based on EDG/Globus middleware

Testbeds

- Production TB – EDG 1.4.12
  - RB, II, MyProxy, RC, VO server at LIP
  - Monitoring (Mapcenter and hostchecking)
- Test & Validation TB – EDG 1.4.12
  - LIP & Demokritos
  - Modified RB at LIP
- Development TB – EDG 1.4.12
  - Modified RB at Valencia, II at Crakow
- Development TB – EDG 2.0
  - LIP + FZK
  - RB, RGMA at LIP

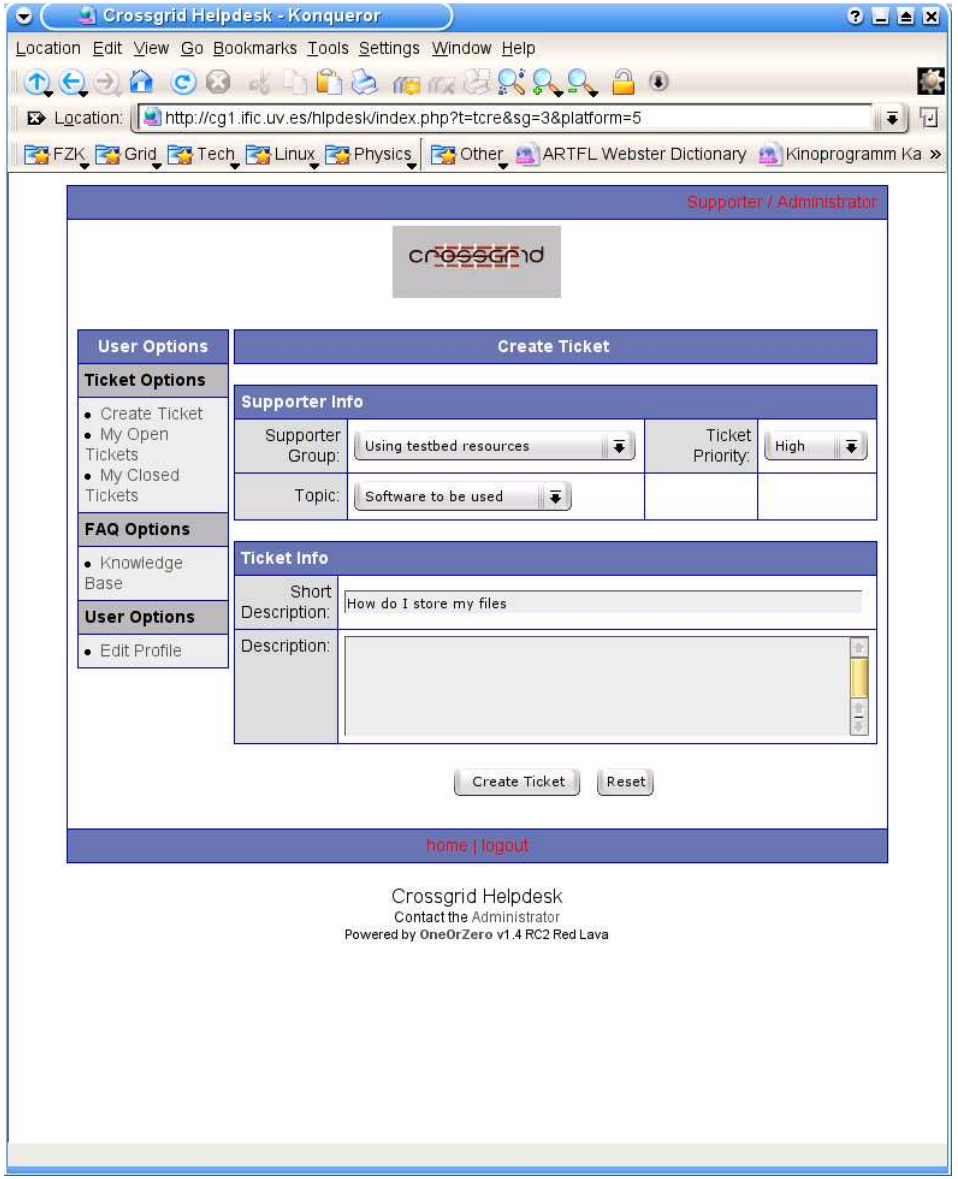
Support infrastructure

Helpdesk

http://cg1.ific.uv.es/hlpdesk/

- In collaboration with DataGrid
- Question-Answer Mechanism:

  "tickets"
- Interaction levels:
  - User
  - Supporter
  - Administrator
- Based on **OneOrZero v1.4**
  - a GPL web based helpdesk system based on PHP, MySQL, Javascript

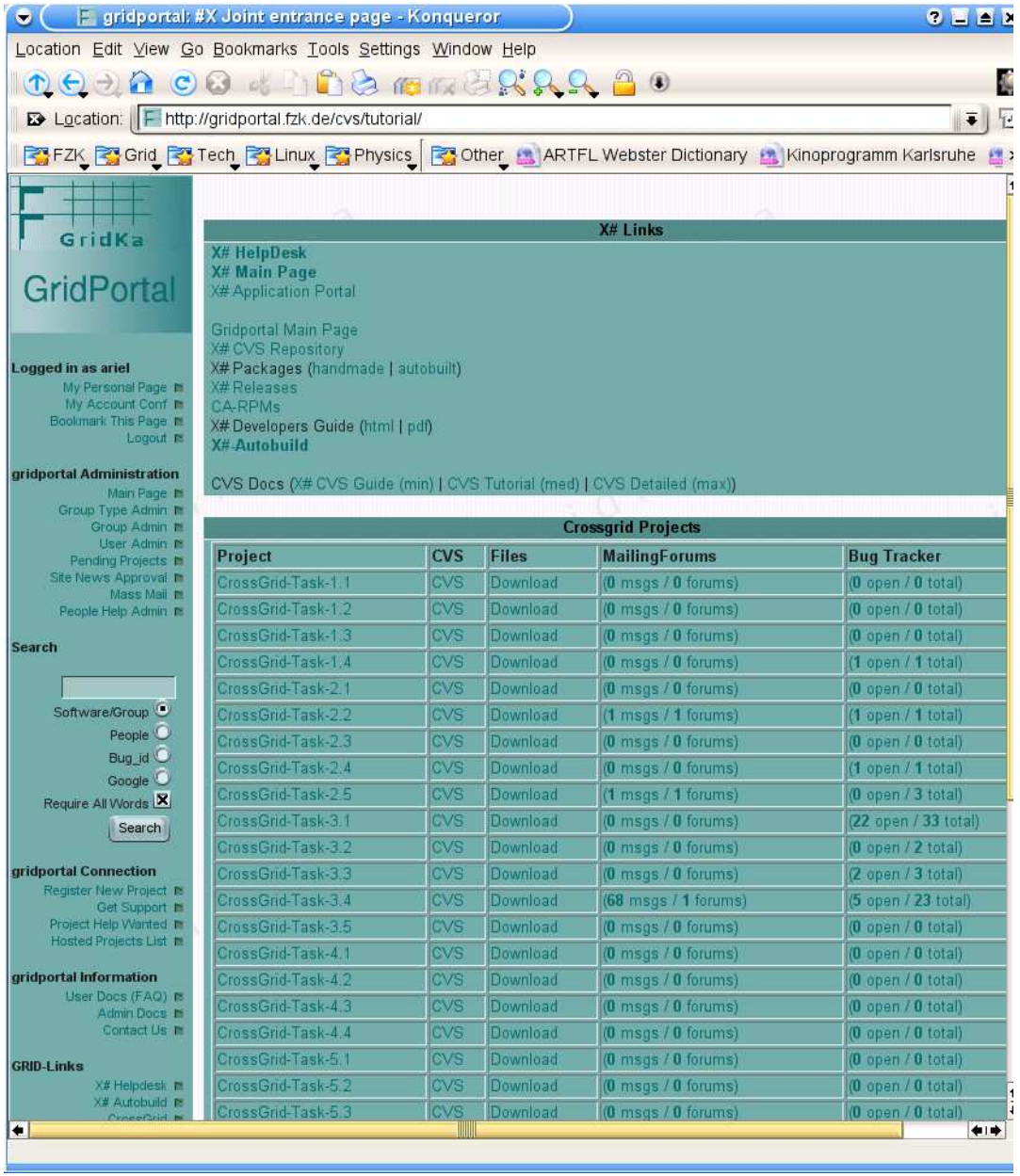


Support infrastructure

Software repository

http://gridportal.fzk.de

- Customized GNU Savannah
  - Projects with
    - Mailinglists/forums
    - Bugtrackers
    - CVS access
    - Webpages
- CVS repository (viewcvs)
- RPM repository
- EDG repository mirror



Software repository

http://gridportal.fzk.de

- Current usage:
  - ca. 70 web-visits/day
  - 1.100.000 code-lines
    51.000 doc-lines
  - 18 pakages autobuilding

Autobuild

- EDG autobuild (Yannick Patois)
- Mild patching to make it more customizable
- RH 6.2 & 7.3

Support infrastructure

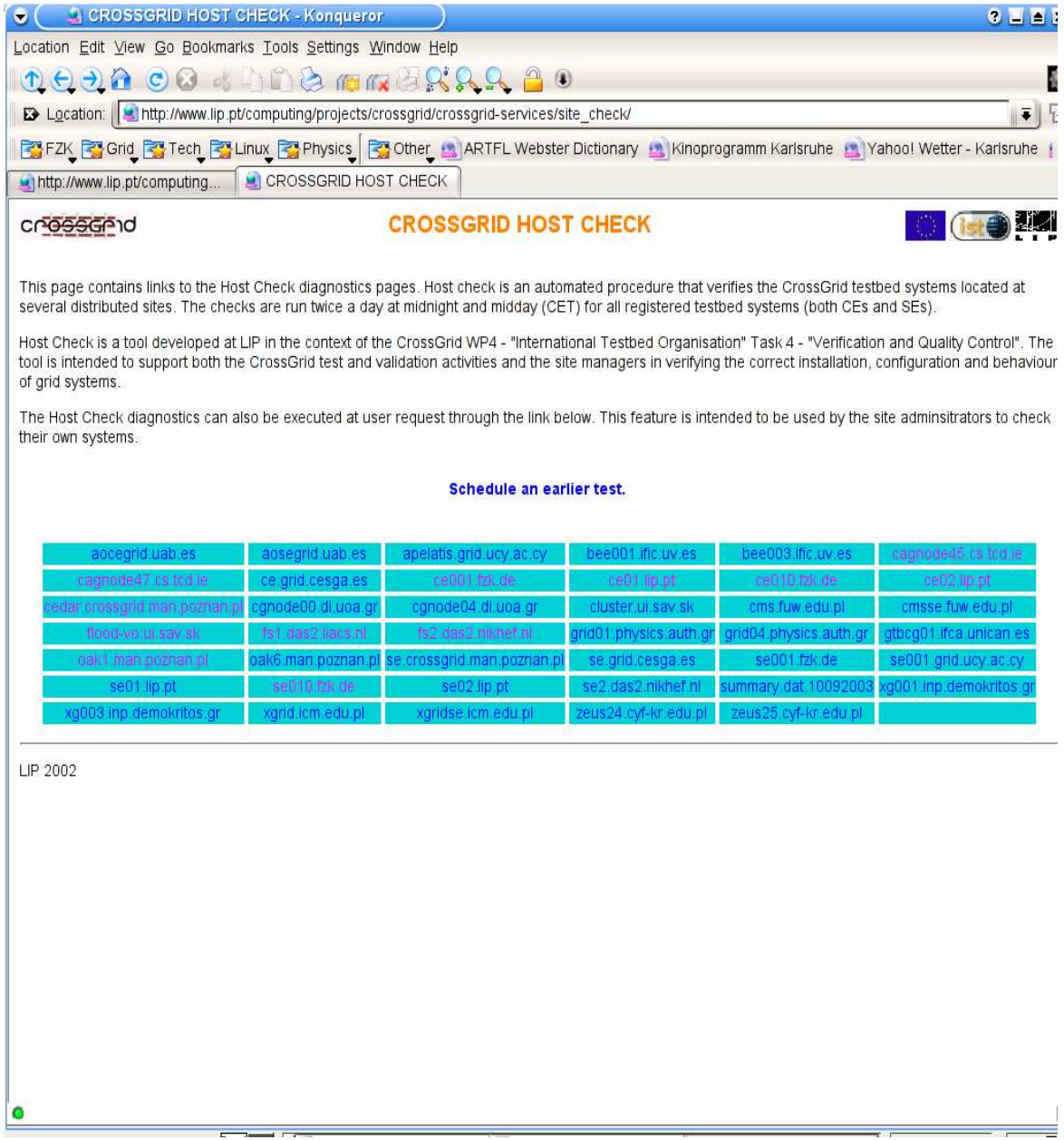
Mapcenter

http://mapcenter.lip.pt

Site checking

http://www.lip.pt/computing/cg-services/site-check

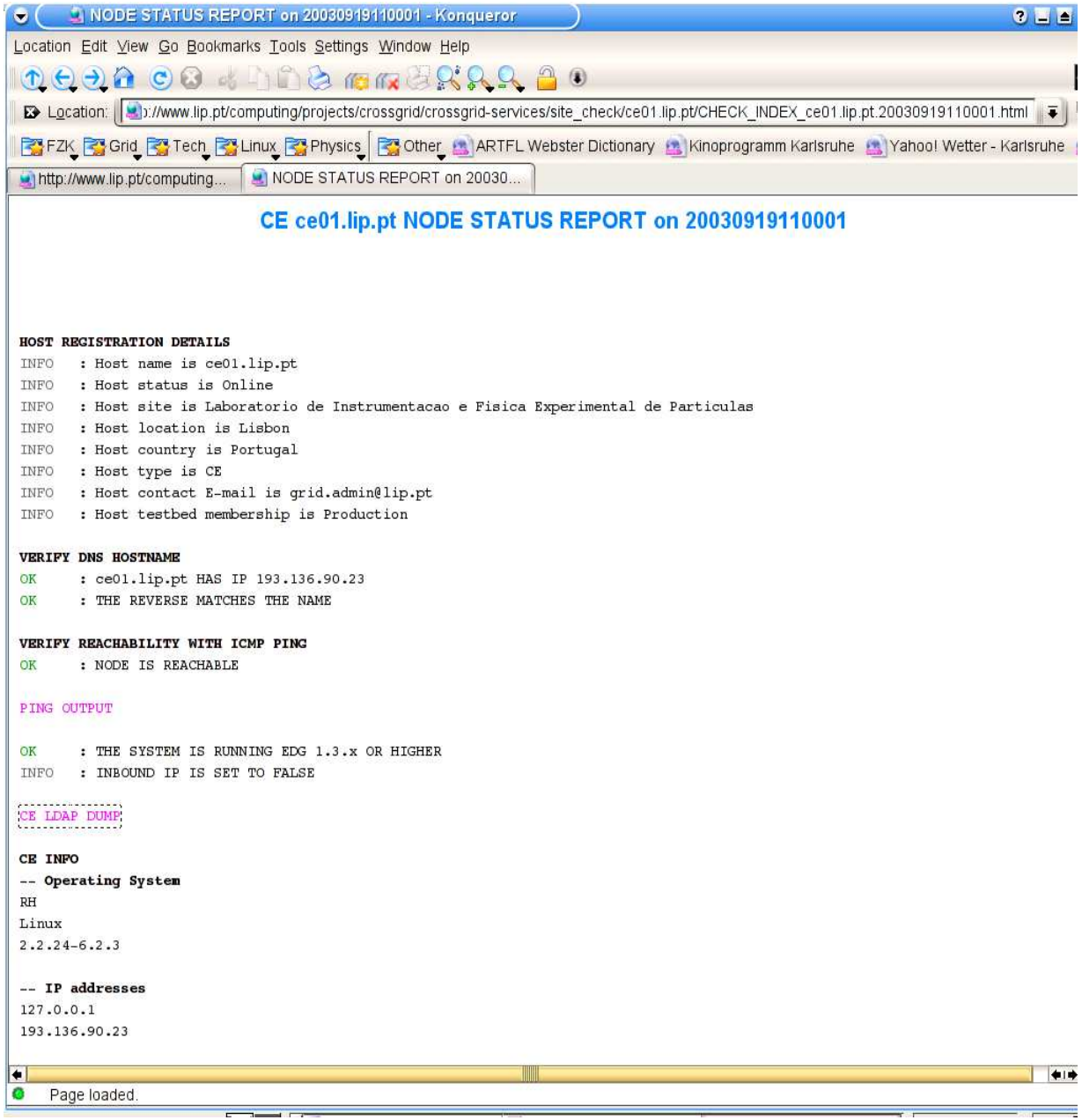
- **Daily checks**
- **On demand checks**



Support infrastructure

Site checking

- Using globus-job-run
- Port checking
- MDS info checking
- PBS configuration
- Gsiftp tests
- CA certs and CRLs checks
- VO config checks
- Etc



Dissemination

- Participation in the GriDis testbed
  - GGF and CERN summer schools
  - Several demos

Plans

- Move to EDG 2.x
  - Applications already under Autobuild RH 7.3
  - Evaluation sites running
  - Several months timeframe (stability ;-)
- Network QoS
- Extension to new sites (cgext VO)
- Security!
- Next middleware steps?

Conclusions

- *CrossGrid testbed is operative*
  - Regular tests and use, including direct MPI execution
- Evolution
  - Testing and validation for:
    - Applications (WP1)
    - Programming environment (WP2)
    - New services & tools (WP3)
  - Emphasis on interoperability with DataGrid
  - Extension of GRID across Europe
  - Advice to follow GT3 while need to follow LCG…

Questions ?

Thanks for your attention!