



E-infrastructure shared between Europe and Latin America

Applications in the EELA Project

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CIEMAT

EGEE06 Conference

Geneva, 25-29.09.2006

www.eu-eela.org





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Biomed

- **EELA Biomedical Applications Fall into *Three Categories***

- Bioinformatics Applications

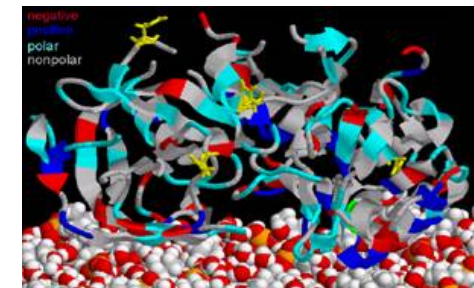
- *BLAST in Grids.*
- *Phylogeny.*

- Computational Biochemical Processes

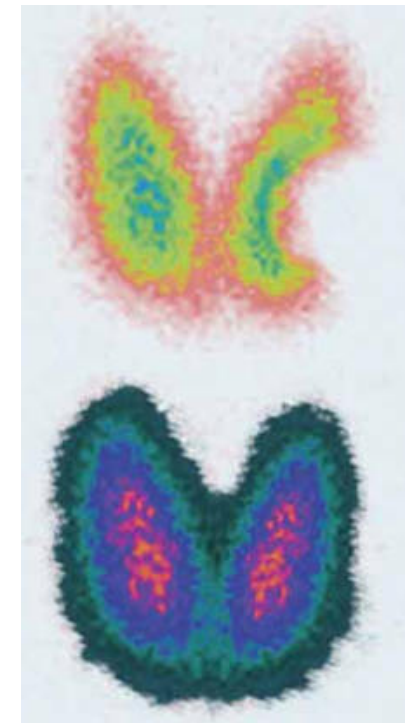
- *Wide in-Silico Docking on Malaria (WISDOM).*

- Biomedical Models

- *GEANT4 Application for Tomographic Emission (GATE)*



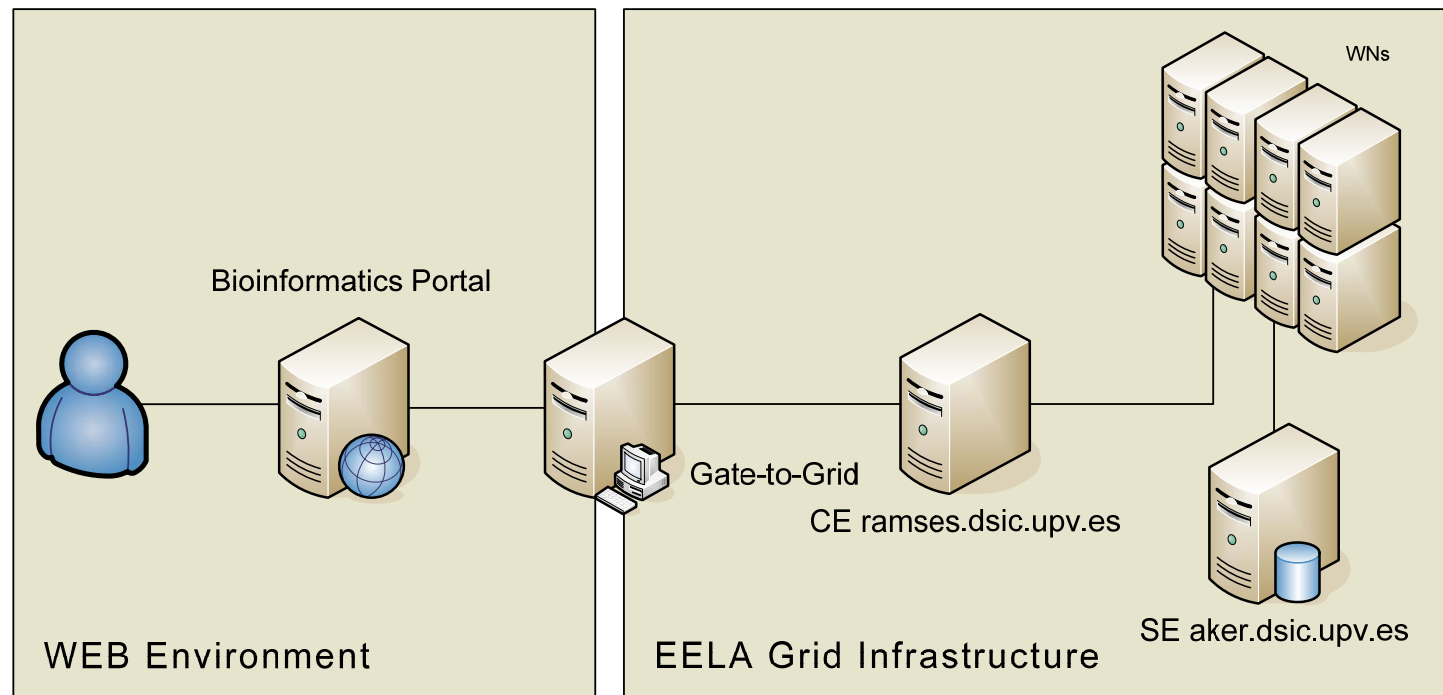
- The Interest of the LA Community is leaded by CUBAENERGÍA
 - It is Focused Towards *Two Main Oncological Problems*:
 - Thyroid Cancer.
 - Treatment of Metastasis with P^{32} .
 - 9 centers in Cuba are Interested (*5 Hospitals and 4 Oncological Centers and Institutions*)
- Installed in several EELA sites



- WISDOM has been installed in the UPV and CIEMAT and can be executed on the whole EELA Grid infrastructure.
 - UPV already participated as Docking Operator in the previous data challenge on Malaria.
- ***An Experiment is Being Prepared Jointly by UPV and ULA.***
 - Targets will be presented in Plasmodium vivax Malaria
- ***Next Steps will be:***
 - Set ULA as Docking Operator and more EELA partners as Donor of Resources in the Docking Data Challenge.
 - Inclusion of New Targets in New Data Challenges.



- Users Access the Service Through a Web Portal.
- Access to the EELA Grid is Performed Through the Gate-to-Grid.
- Gate-to-Grid is an EELA Grid Node Which Provides a WSRF-Based Web Interface.
- Main interest leaded by ULA



- Installed on ULA Computers.
- Tests Have Been Performed Successfully on a Dataset of Around 3000 Sequences of the Plasmodium Falciparum.
- Integration in the Bioinformatics Portal is Completed.



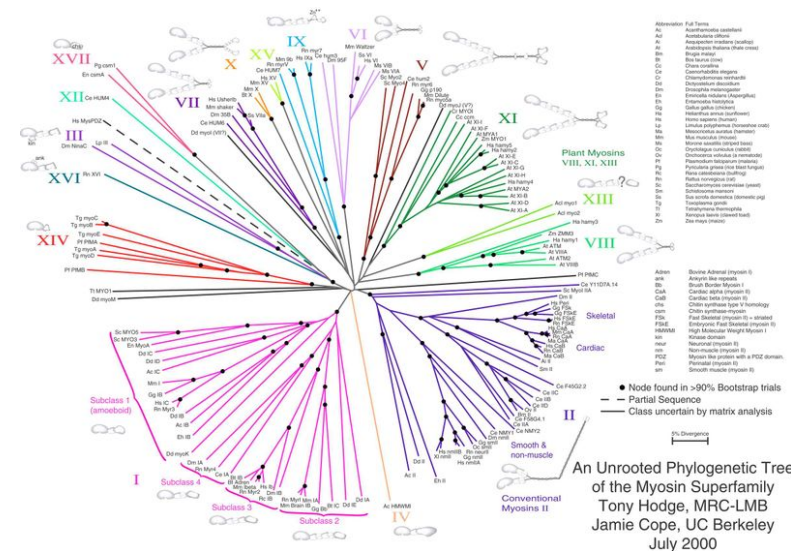
The screenshot shows the 'Portal Iberoamericano de Bioinformática' website. Annotations include:

- A blue arrow pointing from the text 'Tests Have Been Performed Successfully' to the 'Alineamiento con BLAST' link in the left sidebar.
- A blue box containing the text 'Alineamiento con BLAST' with an arrow pointing to the same link in the sidebar.
- A blue box containing the text 'Noticias' with an arrow pointing to the 'Noticias' link in the sidebar.
- A blue box containing the text 'Noticias - enviar' with an arrow pointing to the 'Noticias - enviar' link in the sidebar.
- A blue box containing the text 'Salir' with an arrow pointing to the 'Salir' link in the top right navigation bar.

Other visible elements on the website include:

- Top navigation bar: Salir, Alineamiento con BLAST, Alineamiento con BLAST, Proyecto EELA, Noticias, Noticias - enviar.
- Left sidebar: Menu Principal (Inicio, Mis Datos, Administracion, Direccion de C, Salir), Alineamiento con BLAST, Proyecto EELA, Noticias, Recursos del Portal (Recomendar Libros, Libreta de direcciones, Estadísticas, Diario, Enlaces), Red Iberoamericana de Bioinformática (RIB), Utilidades (Buscar Amazon, Búsqueda en Google, Preguntas Frecuentes, Google), Buscar, Languages.
- Main content area: Participarán destacados investigadores latinoamericanos e ibéricos en un programa que cubrirá bases de datos y herramientas para el estudio de proteínas y ácidos nucleicos, su estructura y función, comparación de genomas, metabolómica, etc. El programa detallado puede consultarse en: <http://www.cytel.org/Fibecyt/documentacion/11%20Jornadas%20Iberoamericanas.pdf>.
- Right sidebar: Enlaces (Biotutor, Curso Bioinfo), Usuarios (Bienvenido Invitado, Nick, Pass, Recordarme, Iniciar, Registrarme), Miembros (Ultimo: danieldr, Total: 647), En línea (Anónimos: 6, Miembros: 1, Total: 7), Forum de Bioinformática, ULTIMOS MENSAJES (wala Bioinformática).

- A Phylogeny is a Reconstruction of the Evolutionary History of a Group of Organisms.
- **Applications:** Gene Function Prediction, Drug Discovery and Conservation Biology.
- Interest of the LA Community
 - ULA is Leading the Interest in the LA.
 - A Grid Service Will be Developed to Run a Parallel Version of MrBayes from the Bioinformatics Portal.
- Demo in EGEE06



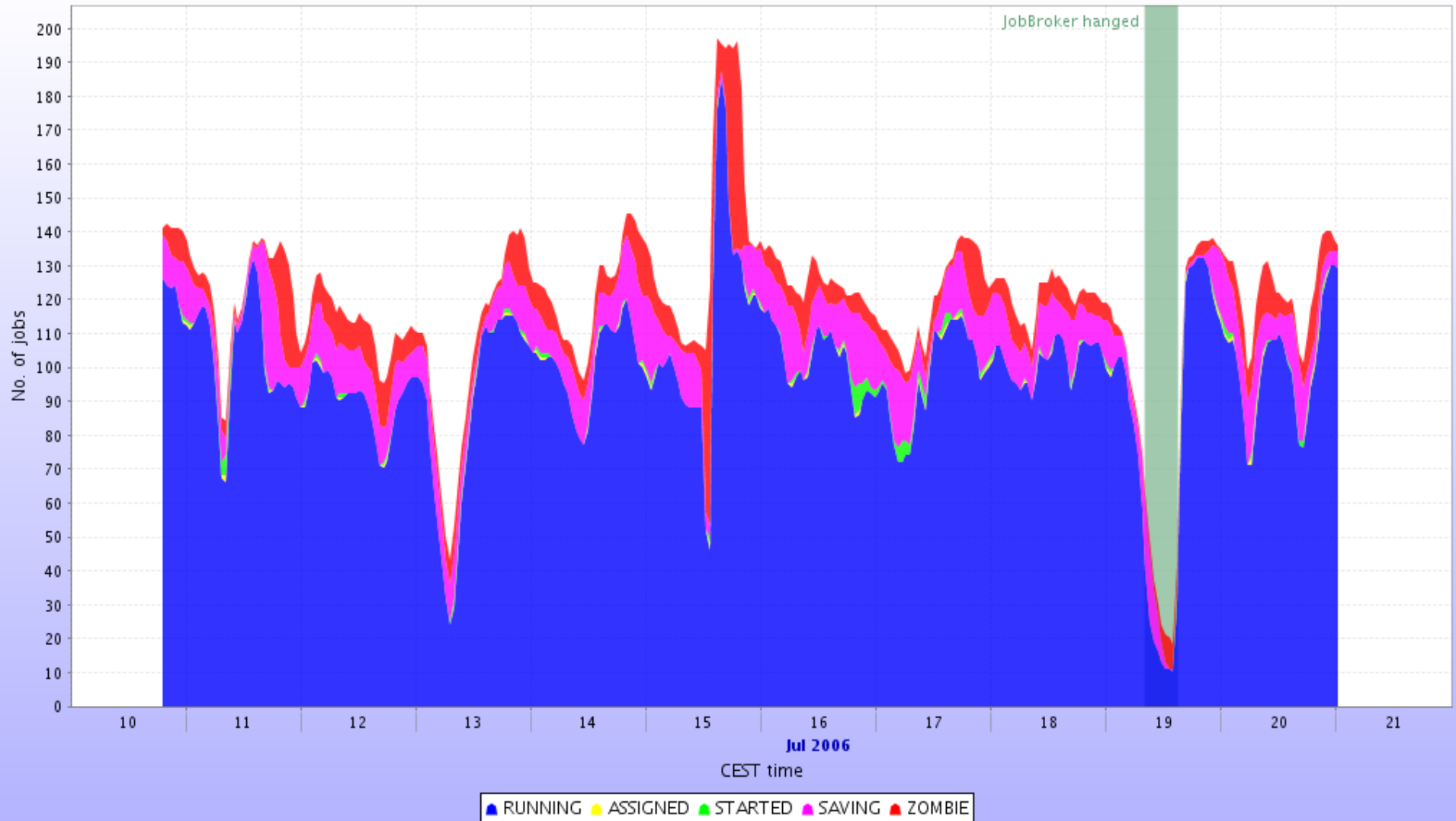


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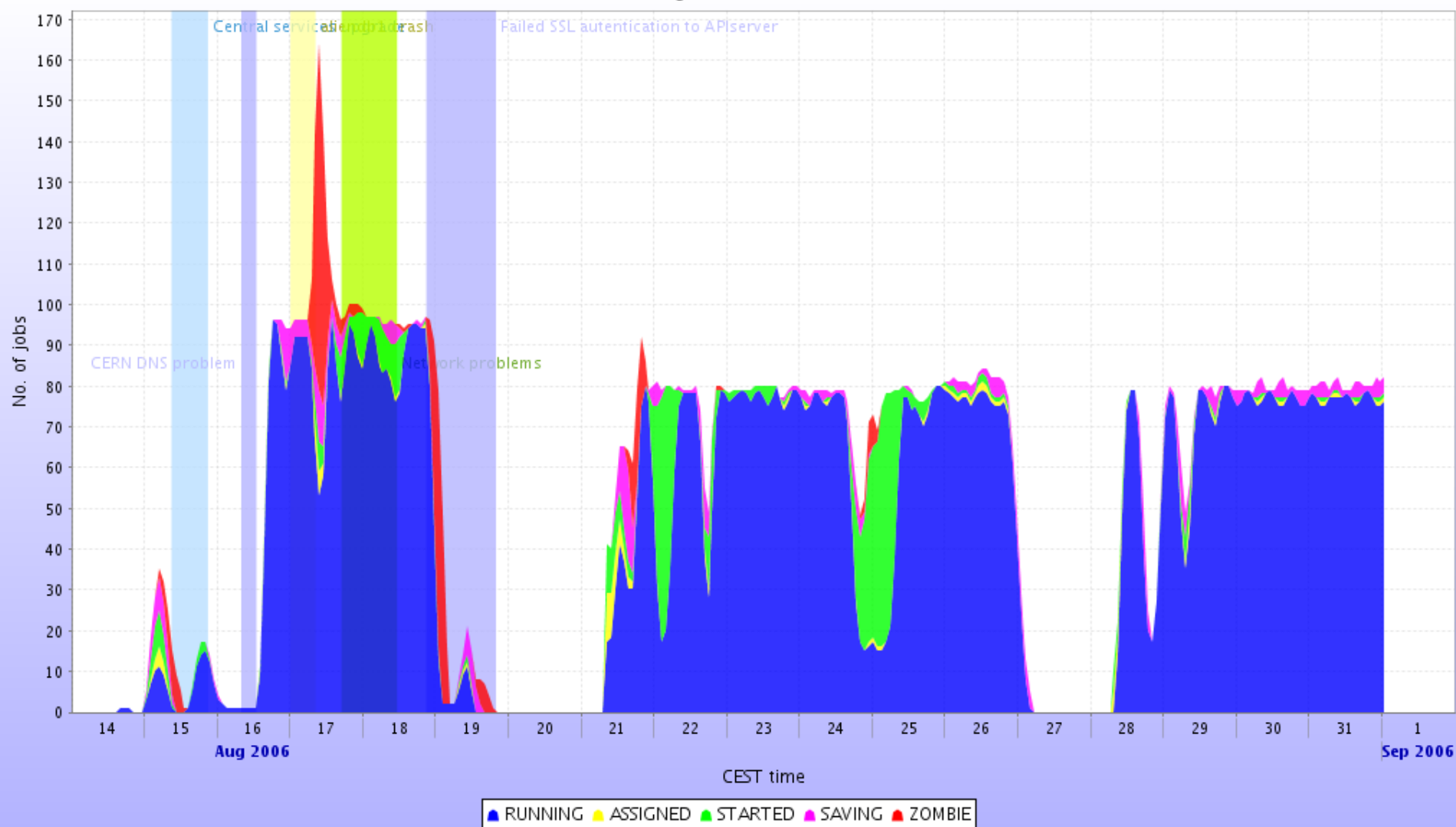
HEP

- **Applications of interest to EELA partners and other communities in Latin America**
 - Initial applications
 - ALICE: Heavy ion physics at LHC
 - *Catania, CIEMAT, and UNAM*
 - LHCb: B physics at LHC
 - *Catania, CIEMAT and UFRJ*
 - Other LHC applications
 - ATLAS (General purpose)
 - *CIEMAT, UFRJ, UNLP and UTFSM*
 - CMS (General purpose)
 - *CIEMAT, has LA participants in EELA member countries, but no EELA partner from LA*
 - New projects
 - Pierre Auger Observatory
 - *UFRJ, UNAM, and UNLP, others in EGEE or partner projects*

Active jobs in Catania



Active jobs in Madrid





LHCb

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INFN - GridICE - Grid Monitoring Service - Microsoft Internet Explorer proporcionado por CENIT 2000

Archivo Edición Ver Favoritos Herramientas Ayuda

Atrás Búsqueda Favoritos Multimedia

Dirección http://ice-eela.ciemat.es/gridice/chart/chart.php?from=Site%3A%3AALL&viewChart=Statistic&typeOfChart=jobStatistic&vs=Site&farm_name=ALL&vo_name=lhcb&startD= Ir Vínculos

the eyes of the Grid
Geo view Site view VO view Help About

GridICE >> Site::ALL

General

Gris

Host

Job

Charts

Network

Jobs Statistic

Jobs Wall Time vs time

Jobs R/Q vs time

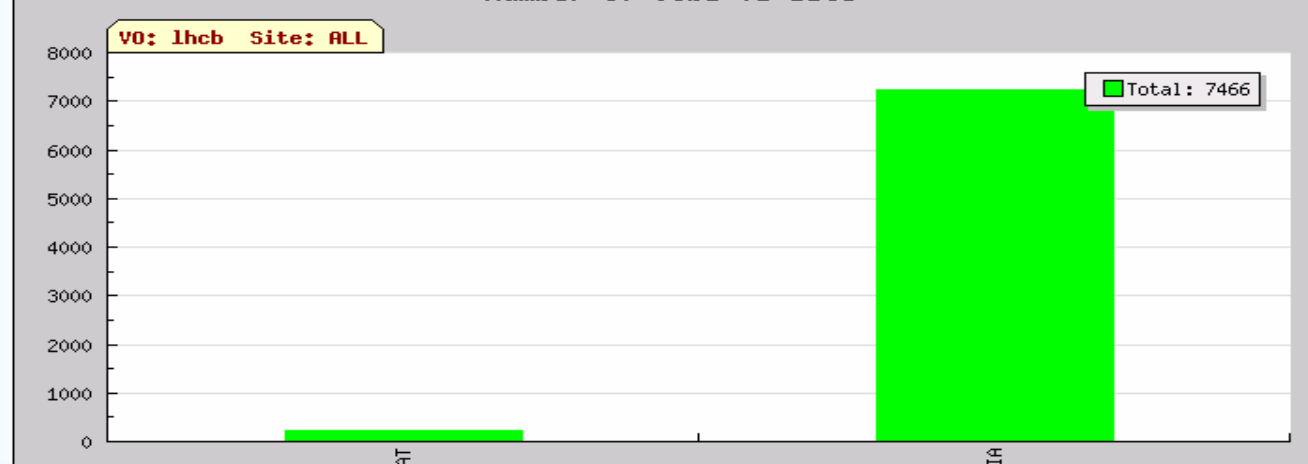
Select the type of chart: Number of Jobs Graphic Type vs (x-axis) Site

Select: Site ALL VO lhcb

Set time: From Day 23 Month August Year 2006 To Day 19 Month September Year 2006

Set dimension: Width(pixel) 500 Height(pixel) 300 ☐ Show Value View Graph

Number of Jobs vs Site



Listo

Internet

Inicio HepProj... EELA - ... INFN - ... Microso... EELA-D... Microso... DIRAC ...

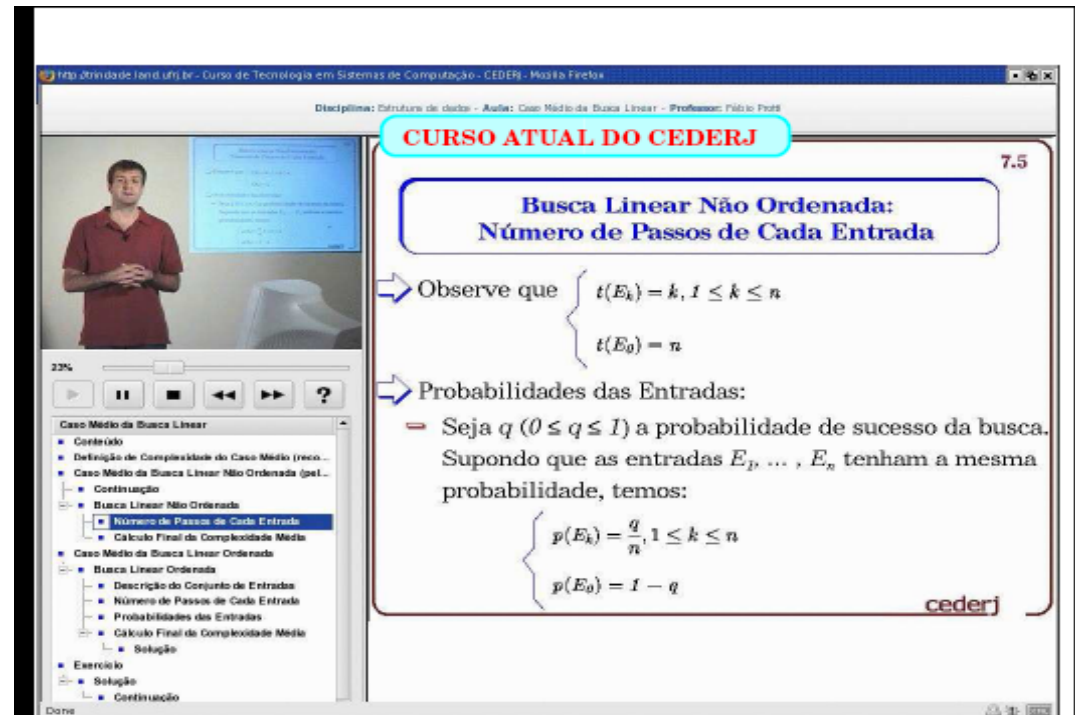
9:15



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e-Learning

- Storage servers will be running on the storage elements
- Multimedia server will continue to manage requests
- Video streams continue to be sent to clients (UDP)
- Backup of classes stored on the grid
- RIO server will be a cache of classes
- Integration with the remote lab



Disciplina: Estrutura de dados - Aulas: Caso Médio de Busca Linear - Professor: Fábio Proff

CURSO ATUAL DO CEDERJ 7.5

**Busca Linear Não Ordenada:
Número de Passos de Cada Entrada**

Observe que
$$\begin{cases} t(E_k) = k, 1 \leq k \leq n \\ t(E_0) = n \end{cases}$$

Probabilidades das Entradas:

Seja q ($0 \leq q \leq 1$) a probabilidade de sucesso da busca. Supondo que as entradas E_1, \dots, E_n tenham a mesma probabilidade, temos:

$$\begin{cases} p(E_k) = \frac{q}{n}, 1 \leq k \leq n \\ p(E_0) = 1 - q \end{cases}$$

cederj

- **Planned Services**

- Access to distributed computer enhanced instrumentation
- Remote access to simulation and modelation capabilities with high performance computing support
- Interactive visualization
- Distributed data analysis with access to data base systems
- Experiment repository system.

Food Engineering

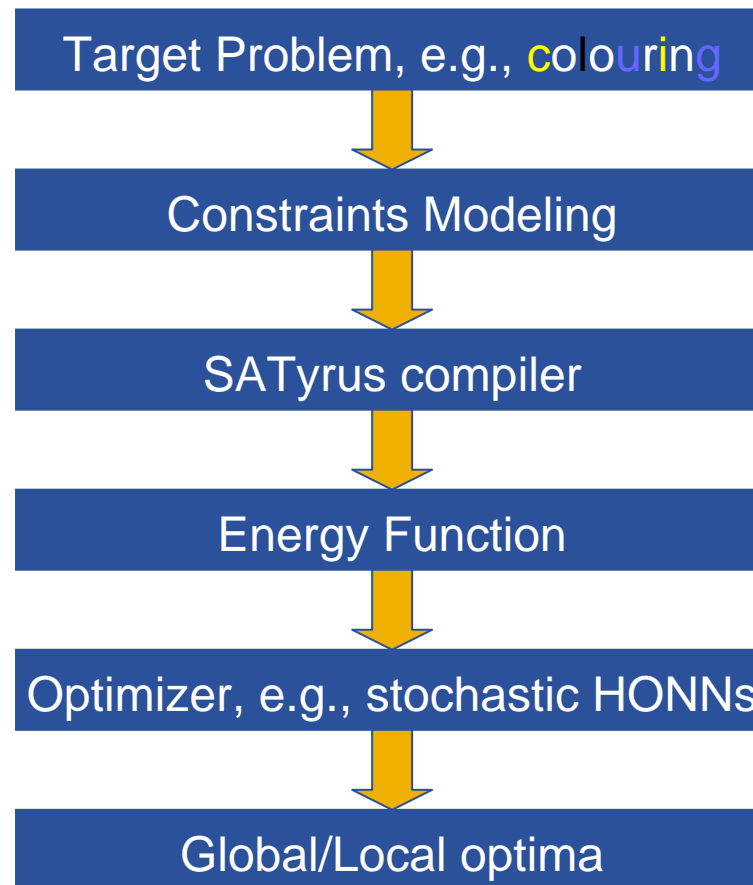
NMR

Electrophoresis

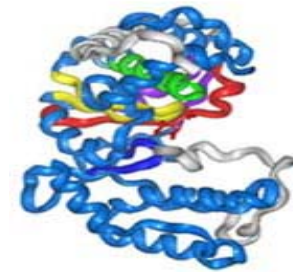
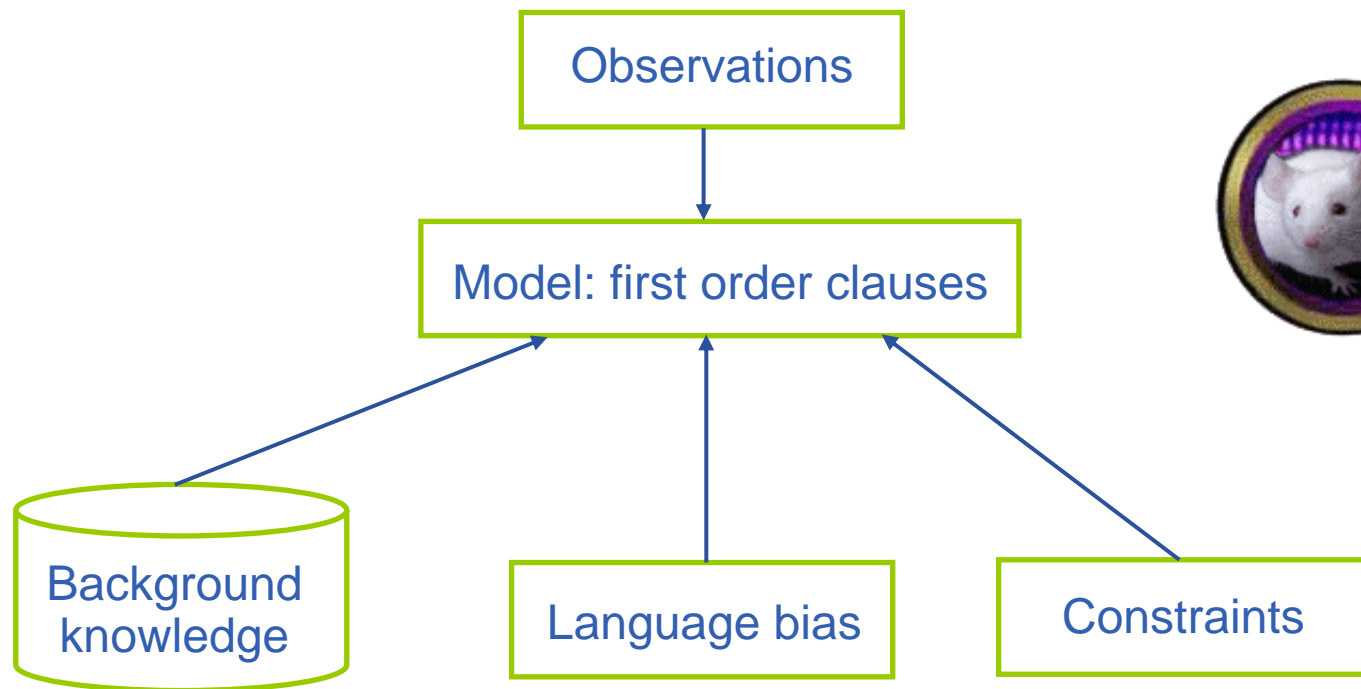
cns_solve

SATyrus:

- SATisfiability-based, neuro-symbolic architecture;
- Exact formulation synthesizer.
- Airport Management (surface)



- Use of Inductive Logic Programming to extract relevant knowledge from structured data

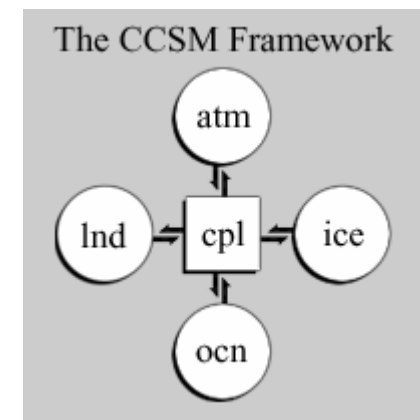




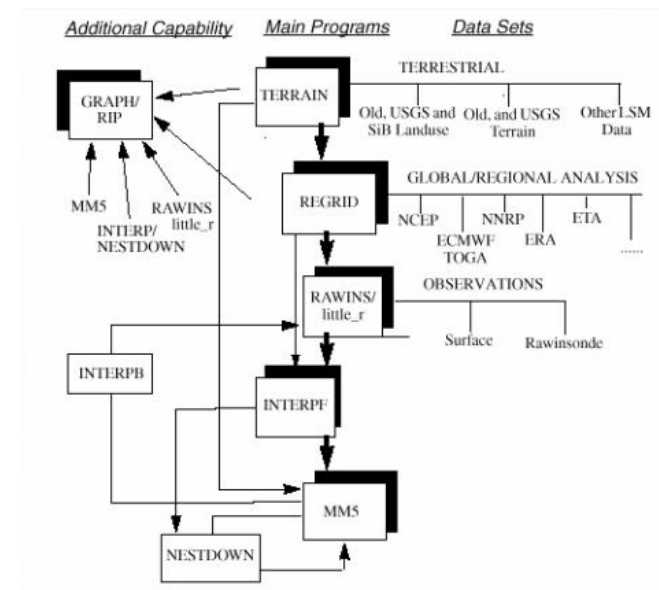
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Climate

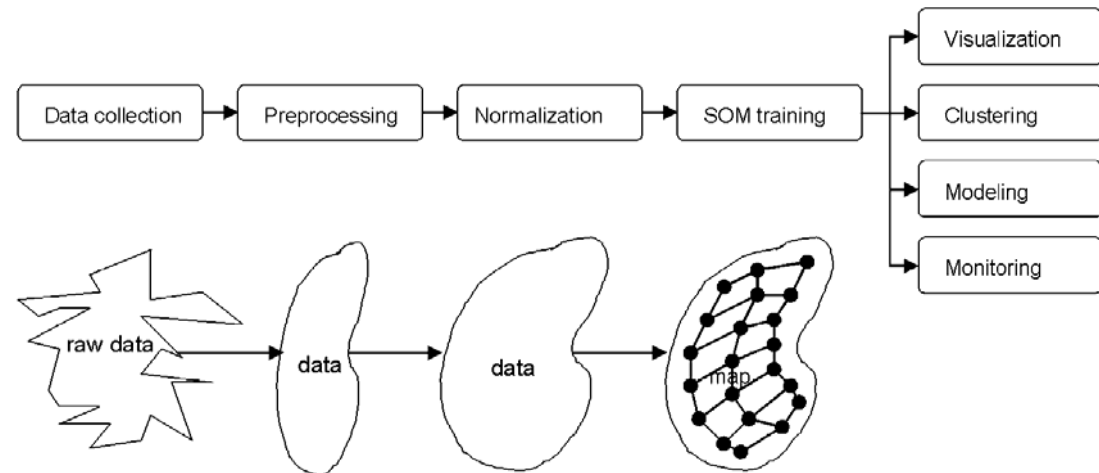
- **Global Climate Atmospheric Model.**
- **This model simulates the evolution of the climate globally at a resolution of 100-300 km, starting with the present sea surface temperature conditions and producing the atmospheric evolution (temperature, humidity, etc.) for a prescribed future period.**
- **Open source model widely use for climate simulations, including climate change.**
- **SENAMHI**



- Regional atmospheric model.
- This regional model runs over a reduced area and takes as boundary conditions the output of a global circulation model, producing a high-resolution (1-10 km) simulation of the atmospheric evolution.
- Open source model widely use for weather forecast.
- UdeC



- Data mining clustering algorithm.
- The parallel code for this data-mining algorithm was developed in the CROSSGRID project using MPI. It finds homogeneous clusters within data and organizes them according to their neighborhood relationships.
- The application to climate maps atmospheric configurations to find weather types
- UniCan



- They will be run separately by each partner on their own site
- After that, they will be run in the Grid in a cascade way:

CAM → MM5 → SOM



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Task 3.3 Future Plans

A Grid School will be a must for these applications!

EGRIS1

Itacuruça (Brazil) 04-16/12/2006



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Other Applications

Volcano Sonifications

- **Domenico Vicinanza (CERN)**
- **Currently no definitive method to predict the eruption of a volcano has been discovered or implemented (yet)**
- **The calculations have been performed in the EELA e-Infrastructure by INFN & CERN**



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Thanks for your attention!