pallas

Member of the ExperTeam Group

The UNICOREpro Client

Introduction to Client Plugins

Ralf Ratering
Pallas GmbH
Hermülheimer Straße 10
50321 Brühl, Germany

ralf.ratering@pallas.com
http://www.unicorepro.com

Functionality of the UNICOREpro Client

- Job Preparation
  - File, execution and control tasks
  - Complex workflows
  - Editing, copying, saving, etc.
- Resource Handling
- Job Monitoring
- Job Control
- Remote File Browsing
- Certificate Handling

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Plug-In Concept

- Add your own functionality to the Client!
  - Heavily used in research projects all over the world
  - More than 10 plug-ins already exist
- No changes to basic Client Software needed
- Plug-Ins are written in Java
- Distribution as signed Jar Archives

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Deployment and Installation

- User gets Plug-in Jar archive from Web-Site, Email, CD-ROM, etc.
- Store it in Client‘s search path
  1. Lib directory
  2. User Defaults Plugin directory
- Client checks signature
  - Is a certificate in the chain a trusted entry in the keystore?
  - Is the signing certificate a trusted entry in the keystore?

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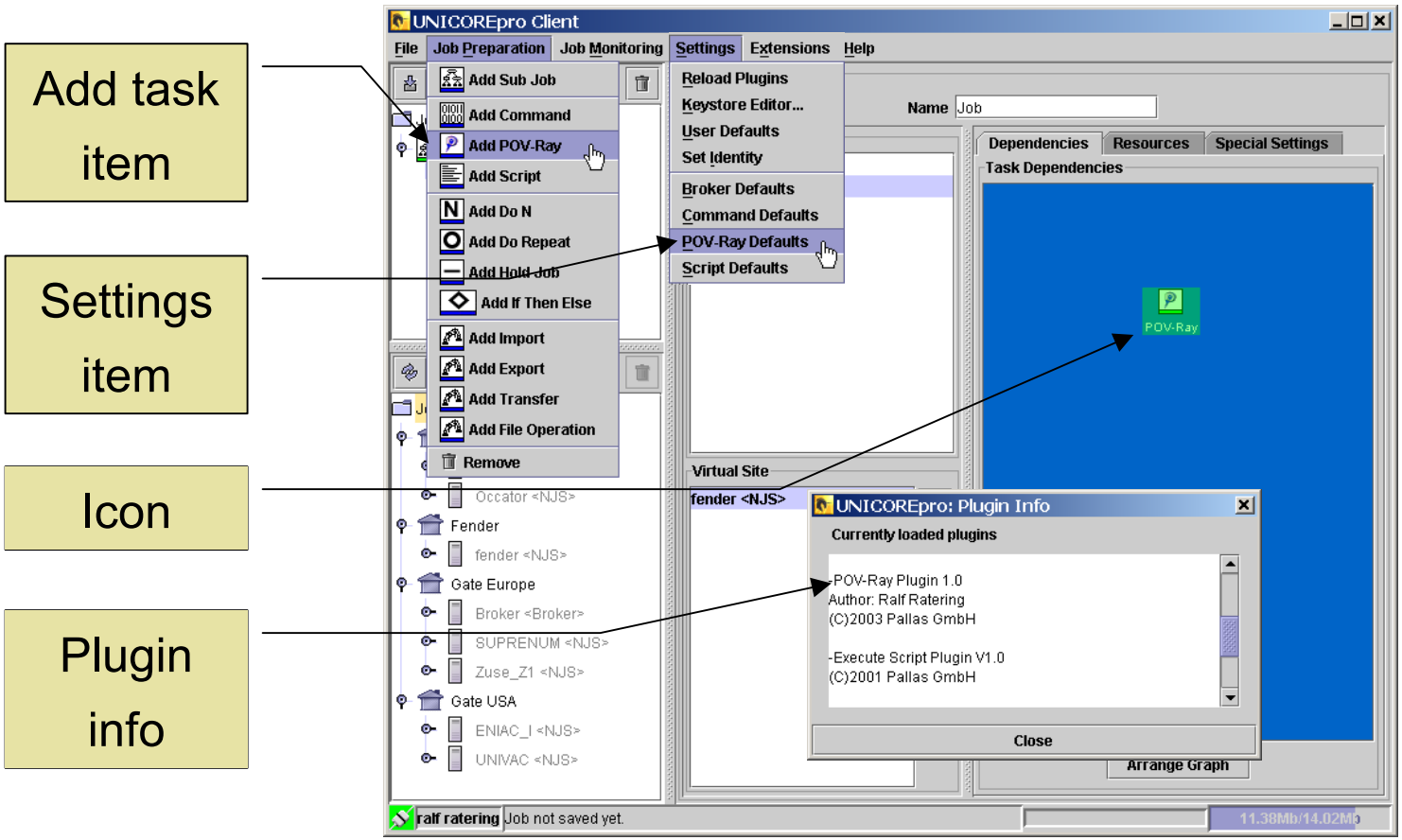
Task Plugins

- Add a new type of task to the Client GUI
- New task can be integrated into complex jobs
- Application support: CPMD, Fluent, Gaussian, etc.



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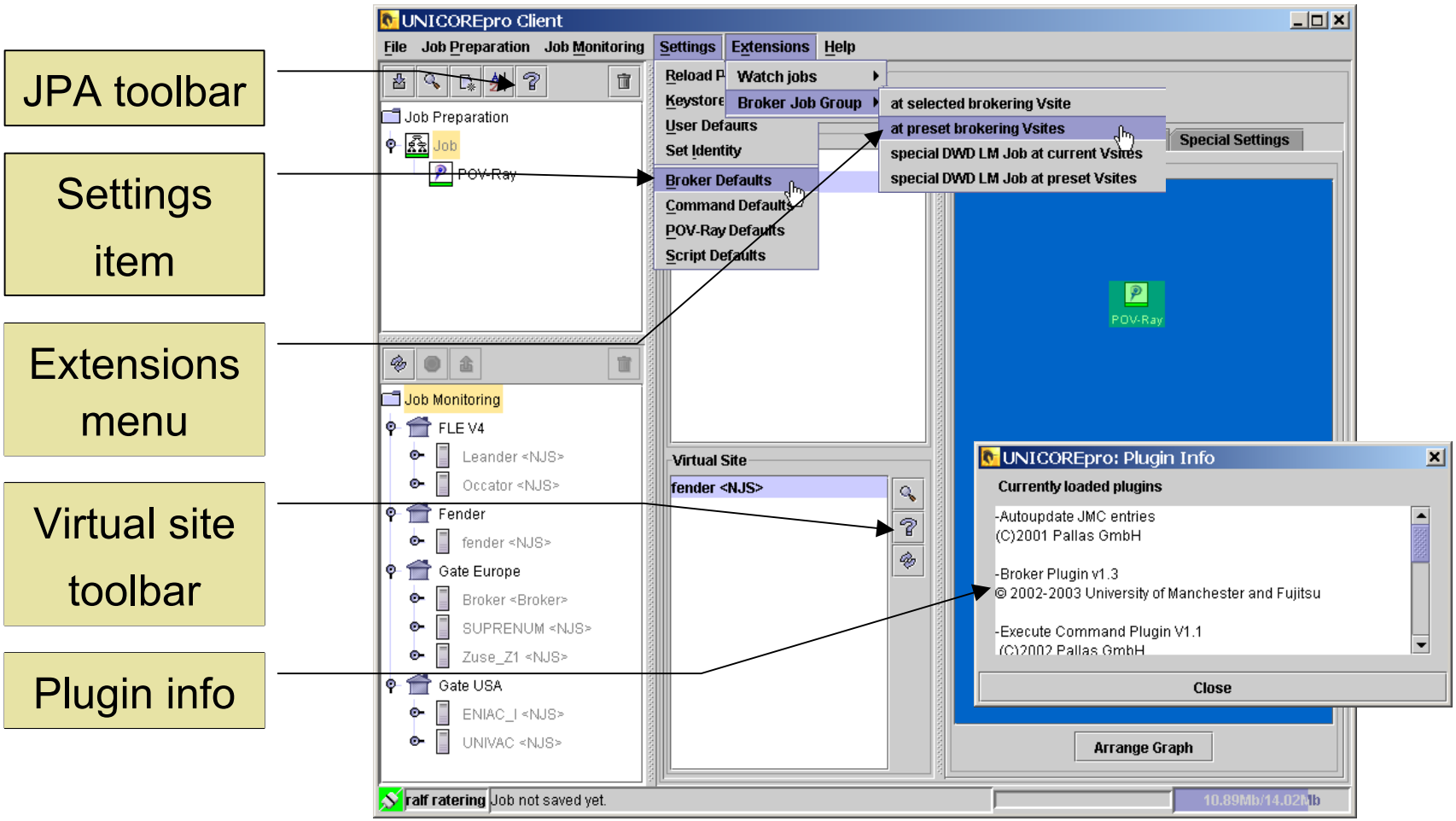
Extension Plugins

- Add any other functionality
- Resource Broker, Interactive Access, etc.



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Supporting an application at a site

- Install the application itself
- Add entry to the IDB

```
APPLICATION Boltzmann 1.0
Description „Boltzmann Simulation“
INVOCATION [
      /usr/local/boltzmann/bin/linuxExec.bin
]
END
```

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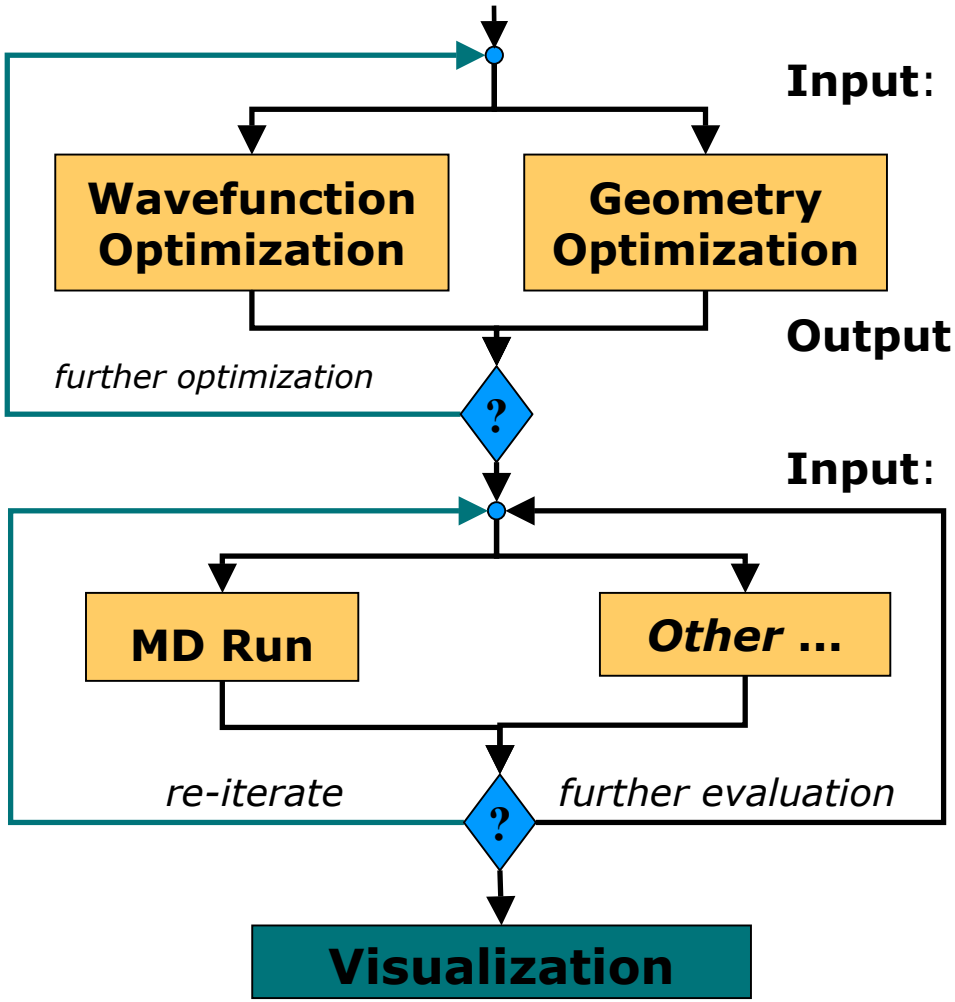
Example Use – CPMD

- Workflow for Car–Parrinello molecular dynamics code



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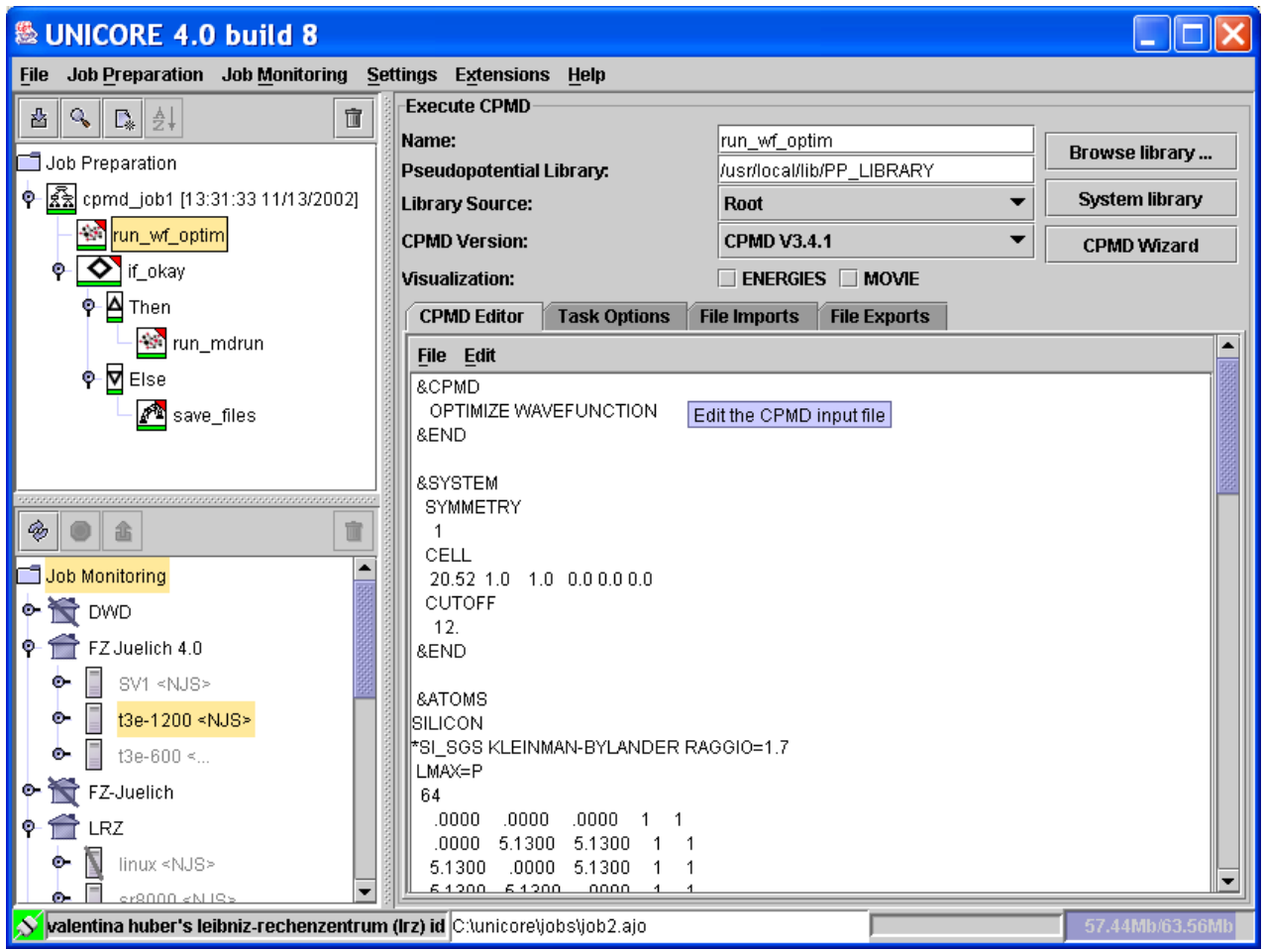
Example Use – CPMD

- CPMD plugin constructs UNICORE workflow



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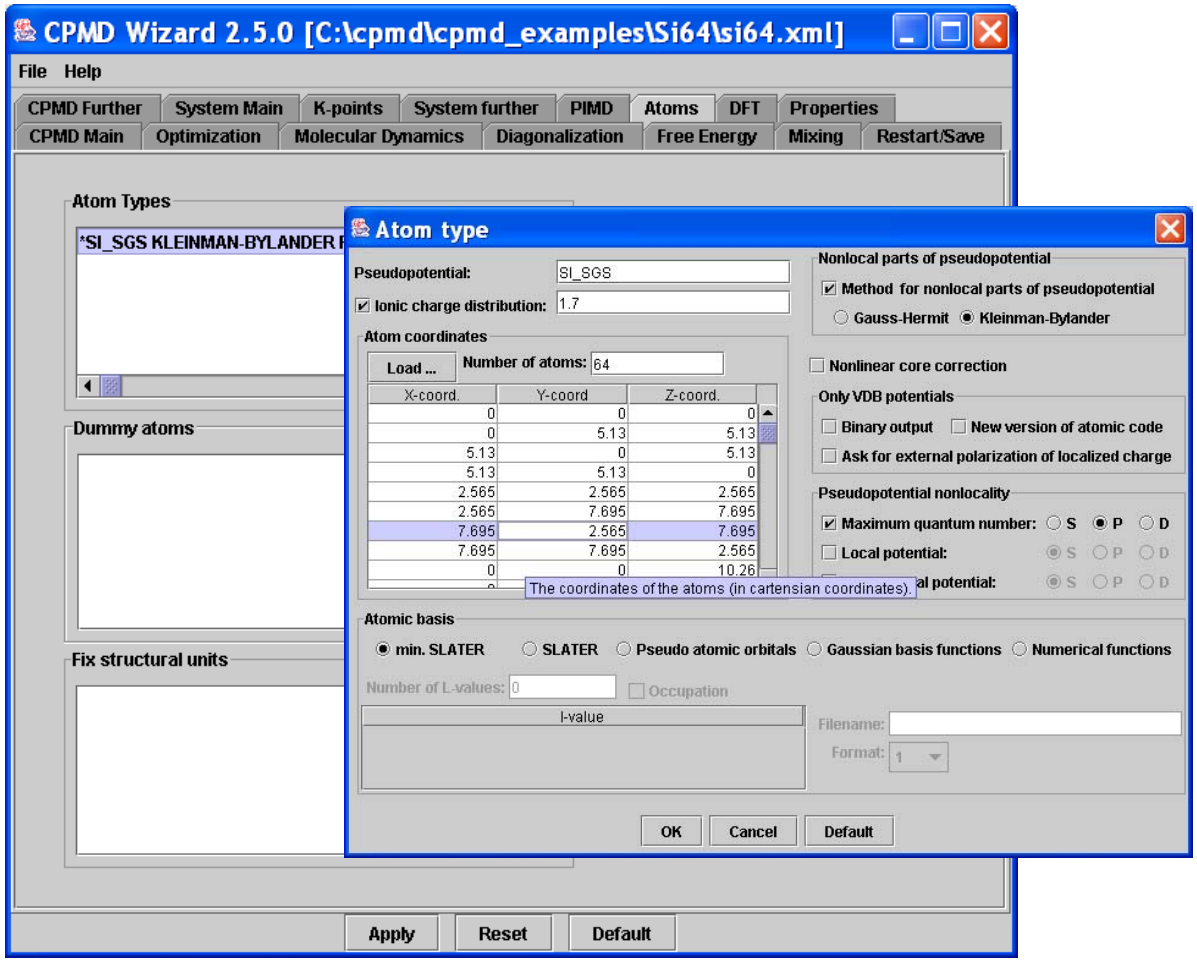
Example Use – CPMD

- CPMD wizard assists in setting up the input parameters



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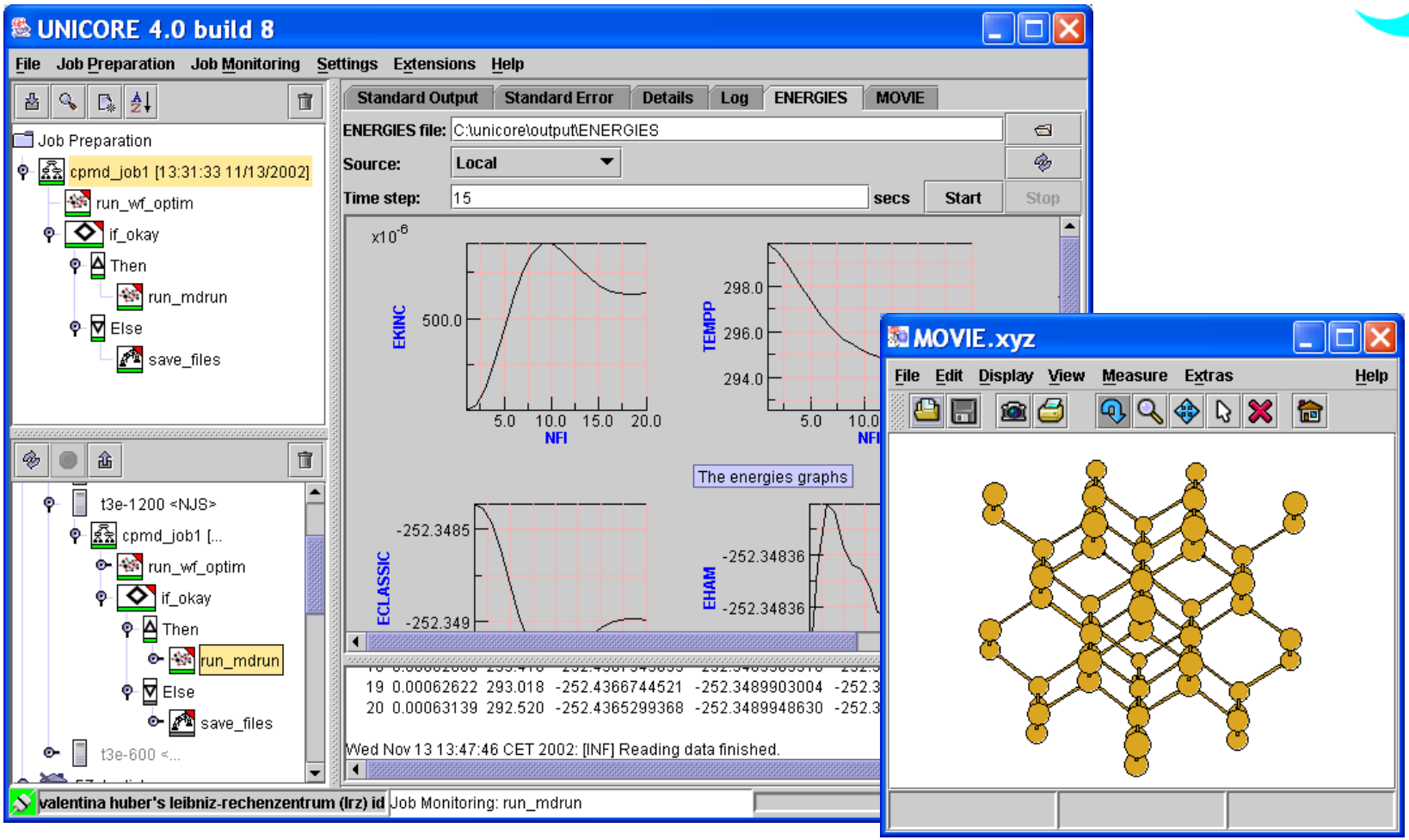
Example Use – CPMD

- Visualize results



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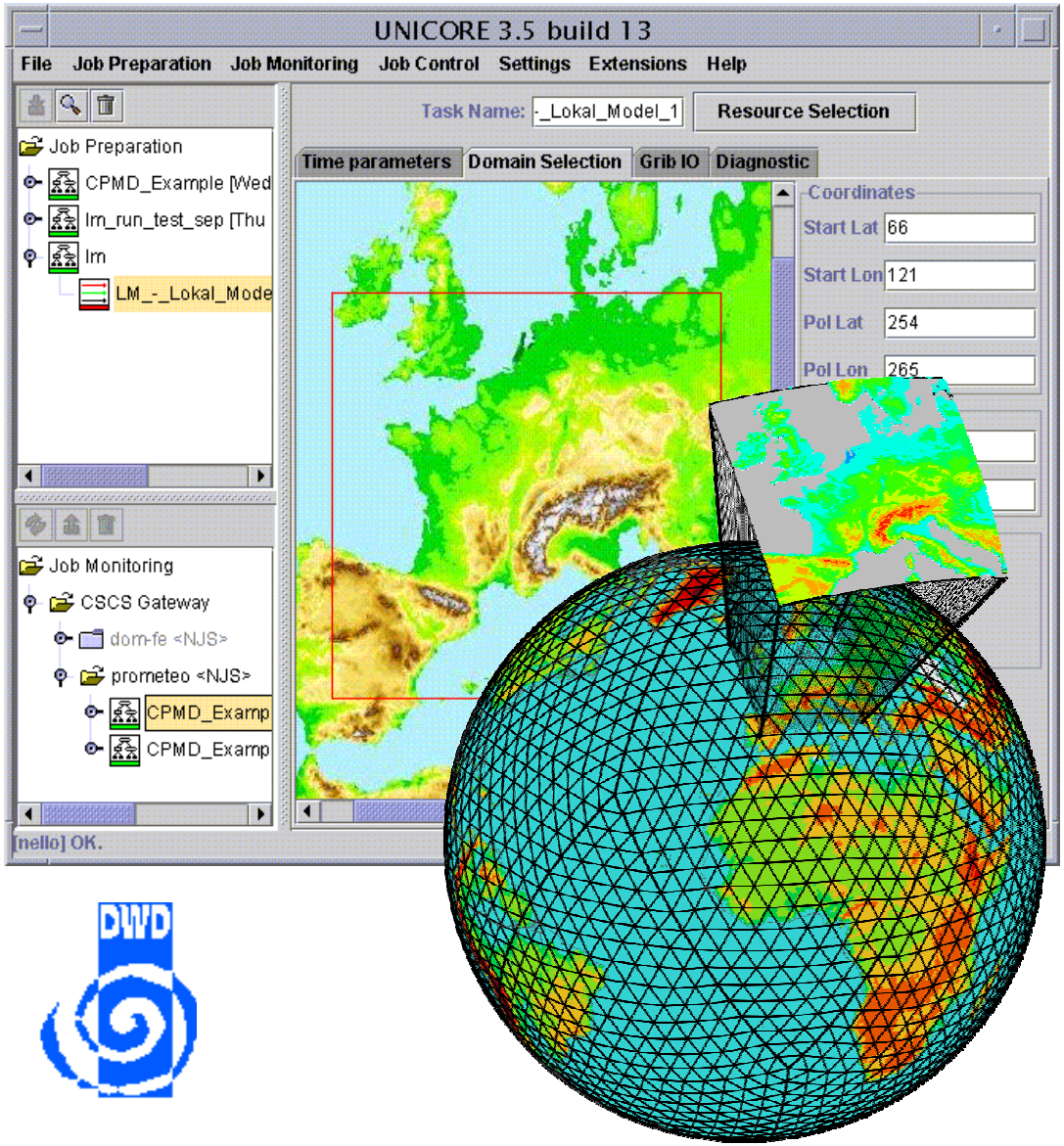
Example Use – On Demand Weather Prediction

- On demand mesoscale weather prediction system
- Based on relocatable version of DWD's prediction model
- Works from regular prediction data, topography and soil database



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Example Use – On Demand Weather Prediction

User Workstation

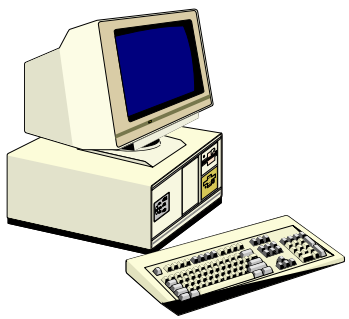
EUROGRID

DWD

GME2LM
interpolation
to LM grid

1–5 MByte Topography & soil data

~50 MByte Regular prediction data



input datasets for LM
(1–20 GByte)

LM-forecast data
visualisation

50–100 MByte

LM
calculation of mesoscale
prediction

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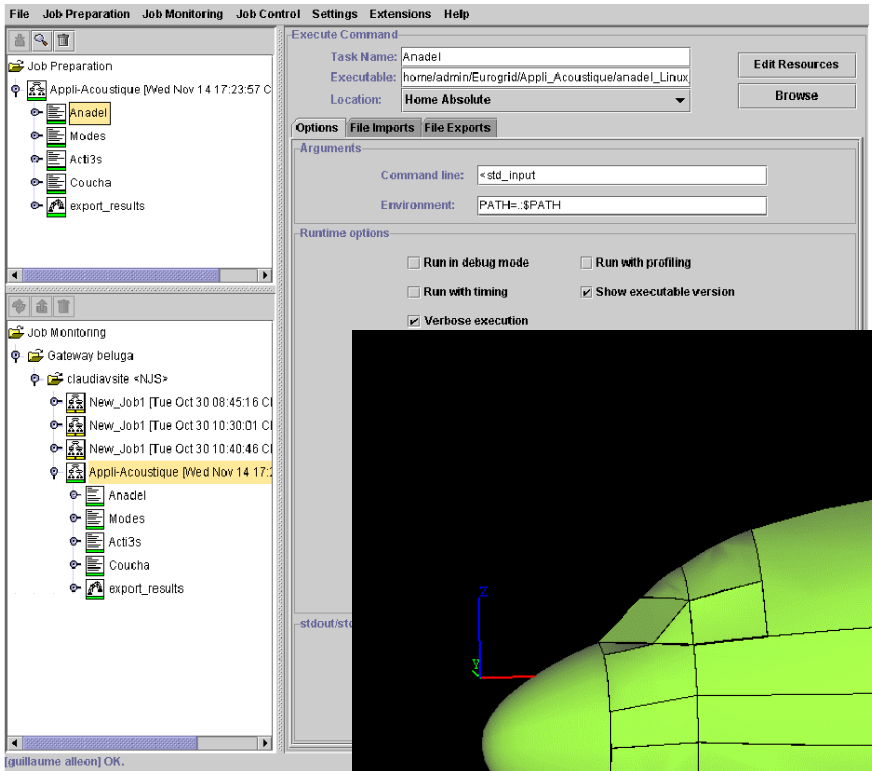
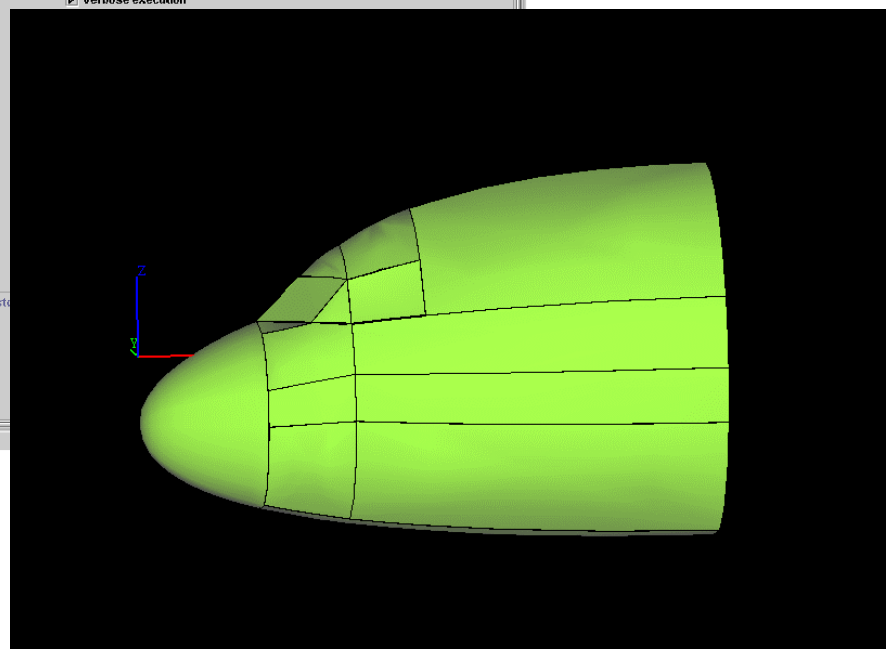
Example Use – Coupled CAE Applications

- Run coupled aerospace simulations (electromagnetism)
- Use CORBA as coupling substrate
- Provide internal portal for Airbus engineers





EADS
European Aeronautic Defence and Space Company

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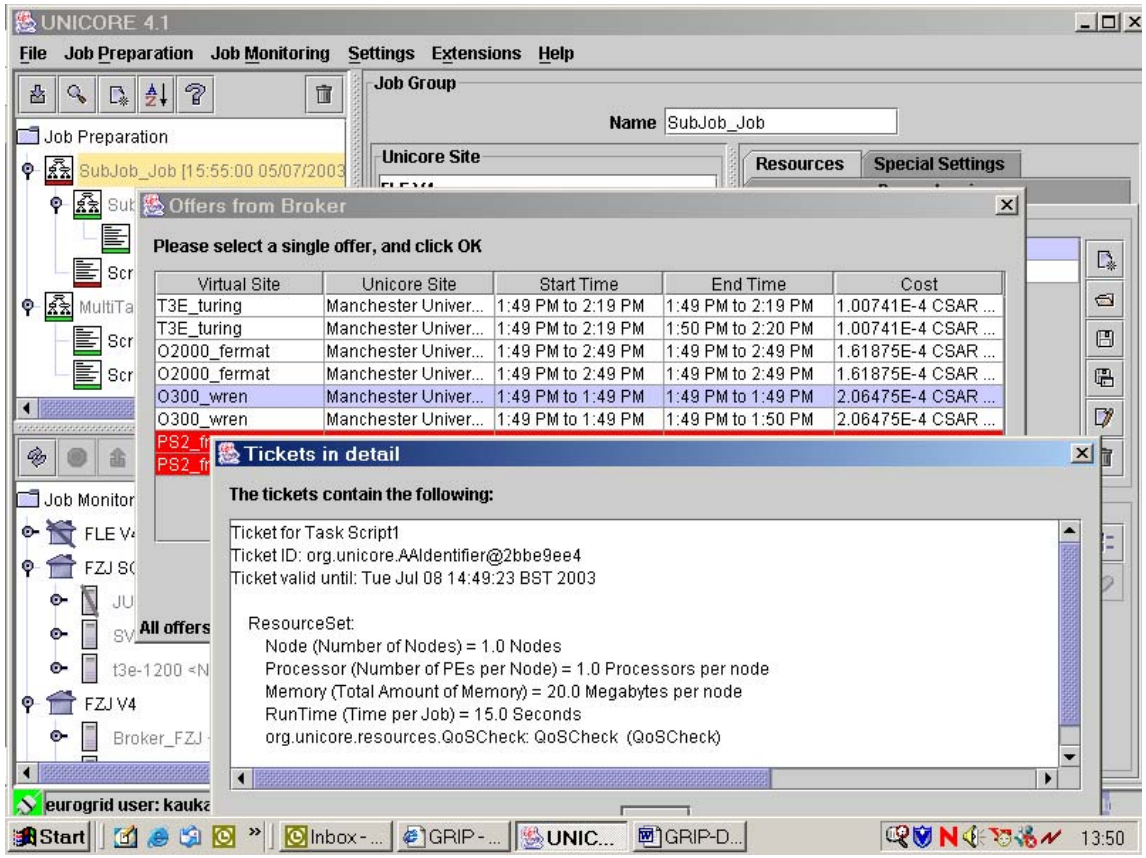
Example Use – Resource Broker

- Specify resource requests in your job
- Submit it to a broker site
- Get back offers from broker



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Overview Application Plug-ins

- CPMD (FZ Jülich)
- Gaussian (ICM Warsaw)
- Amber (ICM Warsaw)
- SQL Database Access (ICM Warsaw)
- Nastran (University of Karlsruhe)
- Fluent (University of Karlsruhe)
- Star-CD (University of Karlsruhe)
- Dyna 3D (T-Systems Germany)
- Local Weather Model (DWD)
- POV-Ray (Pallas GmbH)
- ...

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Overview Extension Plug-Ins

- Resource Broker (University of Manchester)
- Interactive Access (Parallab Norway)
- Billing (T-Systems Germany)
- Application Coupling (IDRIS France)
- Plugin Installer (ICM Warsaw)
- Auto Update (Pallas GmbH)
- ...

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Summary

- With the Plug-In interface everybody can extend the Client functionality
- Implement new task types to support applications
- Add new controls to the Client GUI to invoke custom services
- Write your own Lattice Boltzmann Application Plug-In in the afternoon session!

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