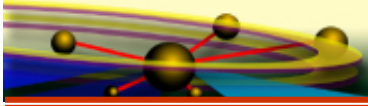


The Migrating Desktop - the General Entry Point to the Grid

Common graphical framework for mobile users

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Agenda

- Main goals
- The Migrating Desktop features
- Architecture overview
- Architecture details
- System functionality
- Conclusions

What's the ideal way to communicate with Grids?

SUN Solaris



Grids

Roaming
Access

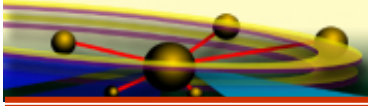
Easy to use
Available everywhere

Linux



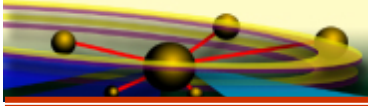
MS Windows





Main goals

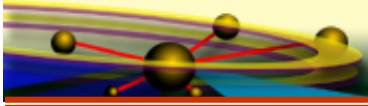
- To deliver one uniform *GUI* that supports different computational and storage infrastructures
- To retrieve the entire user's working environment from any grid access point - support for a mobile user
- To constitute a bridge between the end user and the grid
- To hide the complexity of retrieving all necessary applications and data
- To be platform-independent
- It is easy to add a new functionality (based on web services)



Migrating Desktop

Application oriented framework for mobile users, giving the entire work environment anywhere in the grid

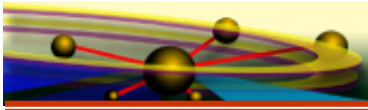
- Open system that integrates access to many grid infrastructure all over the world (across organisations)
- Some features are similar to Java Enterprise Desktop. JED can operate in boundaries of organisation.
- Integration point of many grid tools
- Plug-ins for various file systems (local and remote)
- Grid application support:
 - Different framework for applications plugins
 - MPI job submission support
 - Interactivity support (VNC and java legacy over the grid)
 - Output visualisation
 - Support for local applications.
- Based on web services and Java CoG technology
- It is a Java application - requires a web browser only



Advantages

- Easy to add new functionality (services) into RAS (Roaming Access Server)
 - Migrating Desktop supports container and plugins for applications:
Now it supports plugins:
 - Submission of batch and interactive job (graphical dialog and XML-based)
 - Visualisation of results
 - Visualisation via Java SVG
 - Tool plugin (this facility offers easy way to implement eg. new grid tools. Now in CrossGrid this feature is used by Performance Prediction Tool, Marmot - MPI code debugger)
- MD offers a generic plugin: a library of java interfaces that developer of any application can implement.

RAS is ready to run in multi instances mode (replication of services). It allows better accessability and load-ballancing of services. User chooses the nearest RAS machine.



How does it look like?

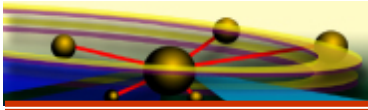
The screenshot displays a desktop environment titled 'Migrating Desktop'. A central window, 'Grid Commander', shows a file explorer view of a directory containing several 'mapadebits' files. Below the file list is a table with columns for 'File path', 'Description', 'Application', 'User', and 'Status'. The table contains three rows of data:

File path	Description	Application	User	Status
https://csg07.inf...	PS-test	1	C=PL,O=GRID...	Done(EDG:6)
https://csg07.inf...	Air Pollution	20	C=PL,O=GRID...	Done(EDG:6)
https://csg07.inf...	Air Pollution	20	C=PL,O=GRID...	Done(EDG:6)

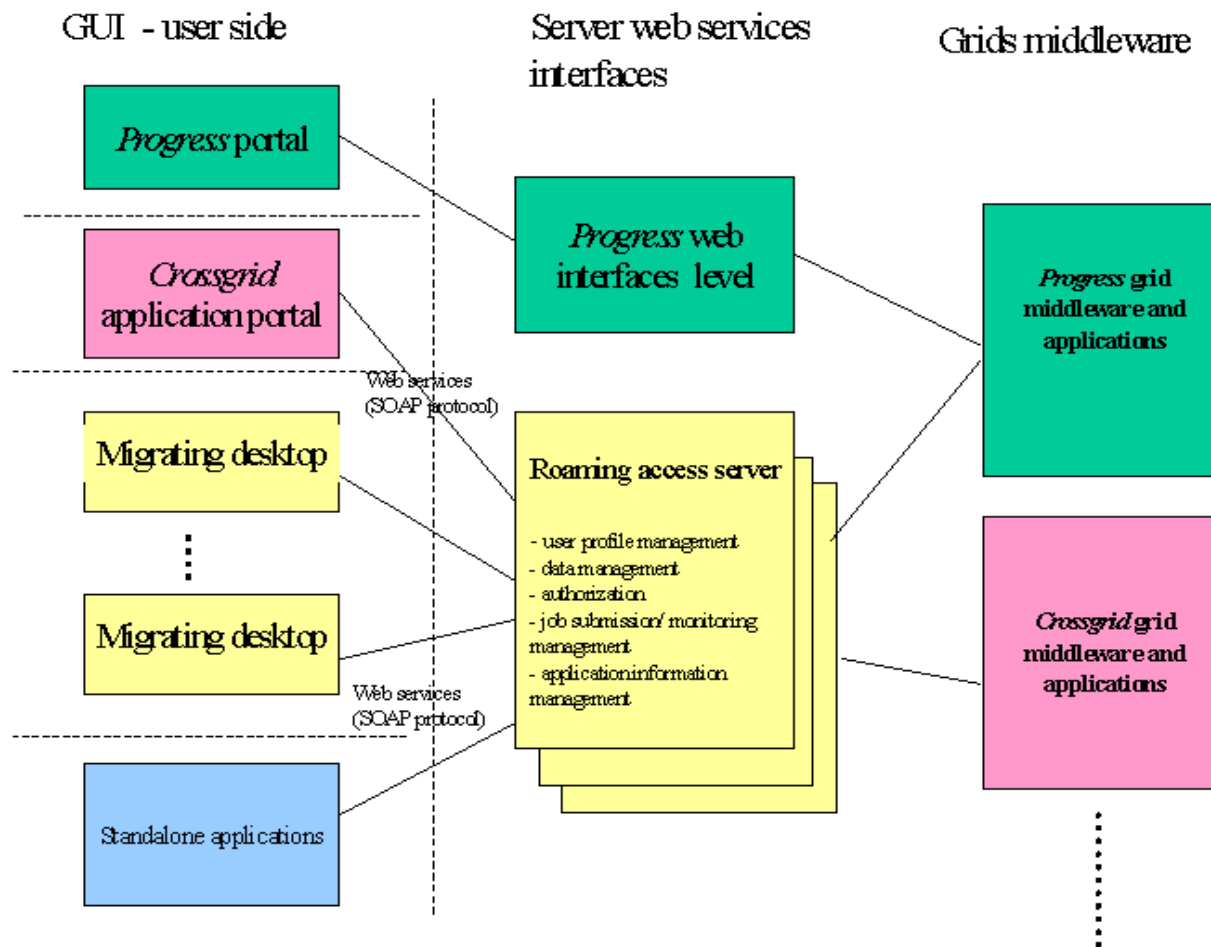
Below the table are three monitoring graphs:

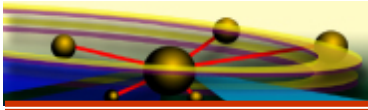
- Computational Power on Grid Nodes:** A line graph showing CPU utilization (%) on the y-axis (0.00 to 0.20) and GRID Nodes (number) on the x-axis (0.0 to 0.0). The utilization starts at 0.00, rises to approximately 0.15 at node 0.0, and then remains constant at 0.15 for subsequent nodes.
- Network Latency:** A heatmap showing latency between GRID Nodes (number) on both axes. The color scale ranges from 0.00 (blue) to 2.00 (red). The diagonal elements are black, indicating zero latency for self-connections.
- Network Bandwidth:** A heatmap showing network bandwidth between GRID Nodes (number) on both axes. The color scale ranges from 0 (blue) to 20 (red). The diagonal elements are black, indicating zero bandwidth for self-connections.

It has to look like your desktop

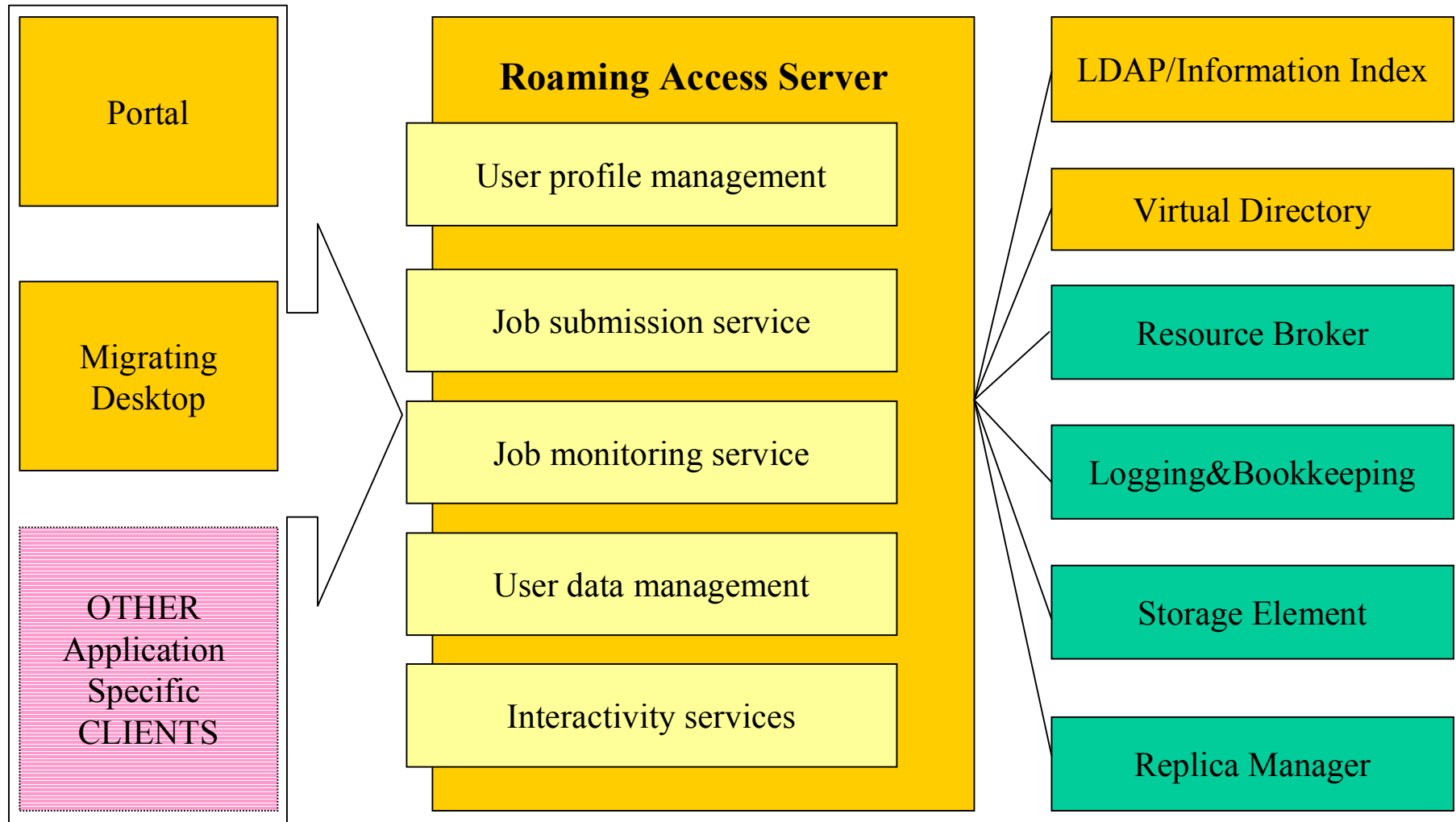


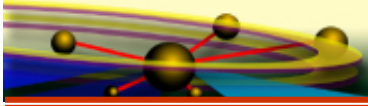
Architecture overview





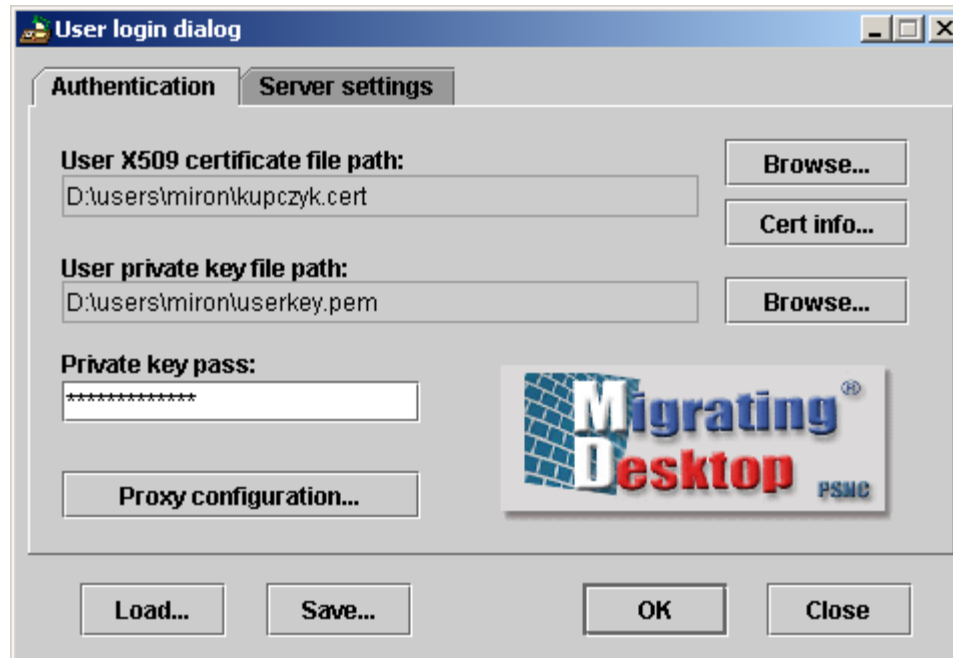
Architecture details



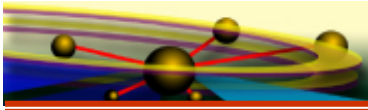


Functionality overview

Single sign-on technology

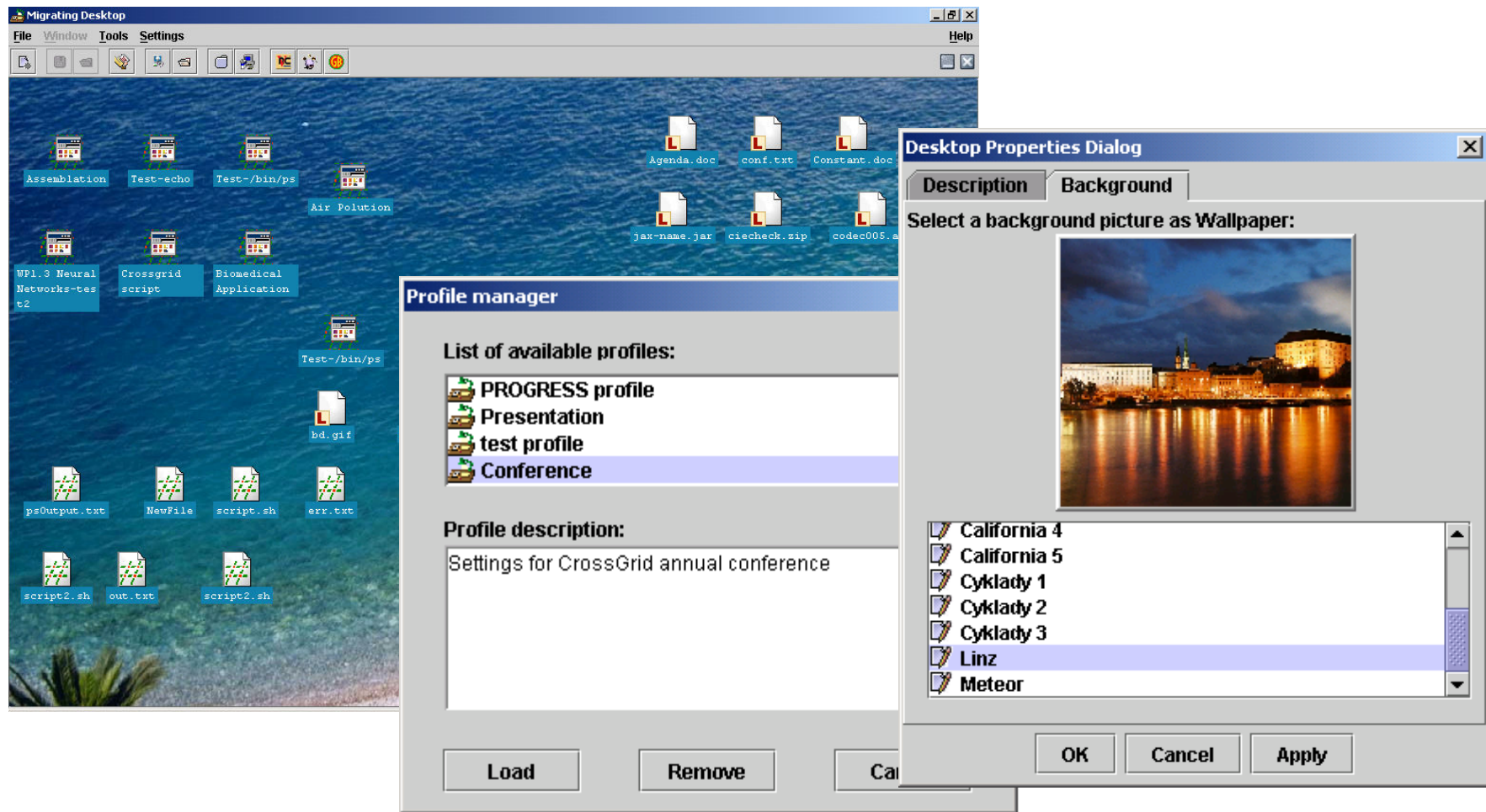


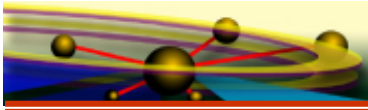
X 509 certificates that are signed by CA for each virtual organisation.



Functionality overview

User settings/profile management





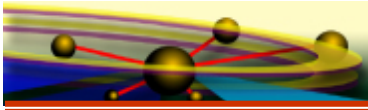
Functionality overview

Job submission/monitoring/visualisation

The screenshot displays a software interface with several overlapping windows:

- Application Wizard:** Shows a tree view of available applications. The 'hep' folder is expanded, showing two sub-items: 'WP1.3 Neural Networks-test2' and 'WP1.3 Neural Networks-test'. The 'Grid' is set to 'crossgrid'. The description reads: 'Classification and Parametrisation of HEP using neural network techniques. WP1.3. version of the application.'
- Job Submission Wizard:** Contains fields for 'Date of the simulation (yyyy-mm-dd)' (2003-02-15) and 'Start hour for the simulation' (00:00). It also has a 'Simulation Model' section with radio buttons for 'Chemical simulation' and 'Non-chemical simul'.
- Job Monitoring Dialog:** A table listing job details. The table has columns for ID, Name, Grid, User, and Status. The data is as follows:

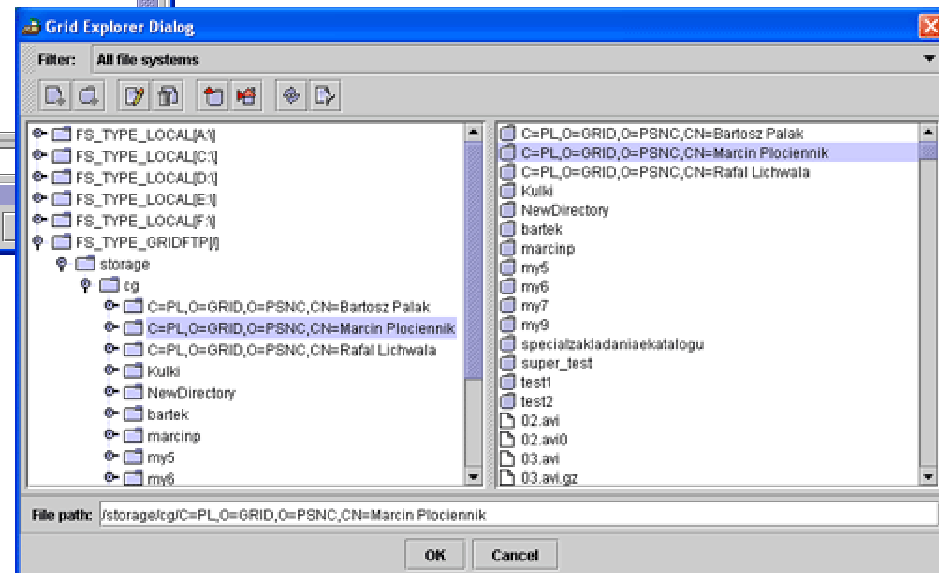
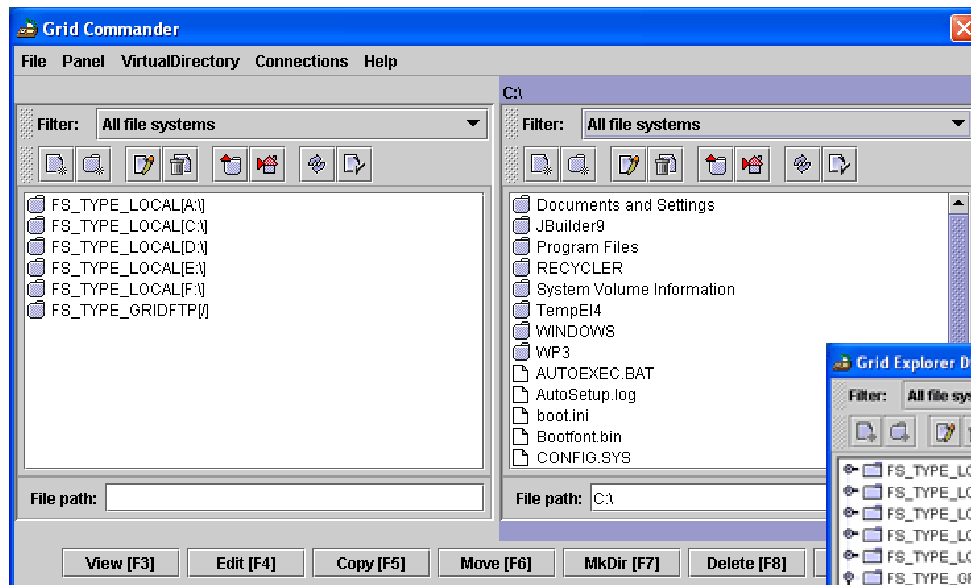
ID	Name	Grid	User	Status	
https://ngrid06.lip.pt:7846/150.254.173.161/20030212...	Crossgrid T...		bartek	Status un...	
https://ngrid06.lip.pt:7846/150.254.173.161/20030212...	Crossgrid T...		Bartek	Status un...	
https://ngrid06.lip.pt:7846/150.254.173.161/20030212...	test-SVG	file test	hep	Bartek	Status un...
https://ngrid06.lip.pt:7846/150.254.173.161/20030212...	my job	that my job	hep	Bartek	Status un...
https://ngrid06.lip.pt:7846/150.254.173.161/20030212...	that is job	my job	hep	Bartek	Status un...
https://ngrid06.lip.pt:7846/150.254.173.161/20030212...	Crossgrid T...		Bartek	Status un...	
- Output View:** A visualization window showing a heatmap with a color scale on the right. The scale ranges from 0.000 (blue) to 0.010 (red).

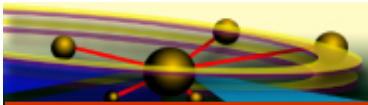


Functionality overview

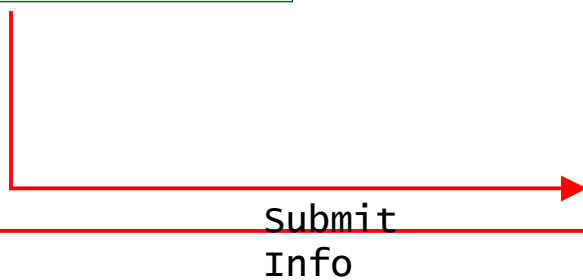
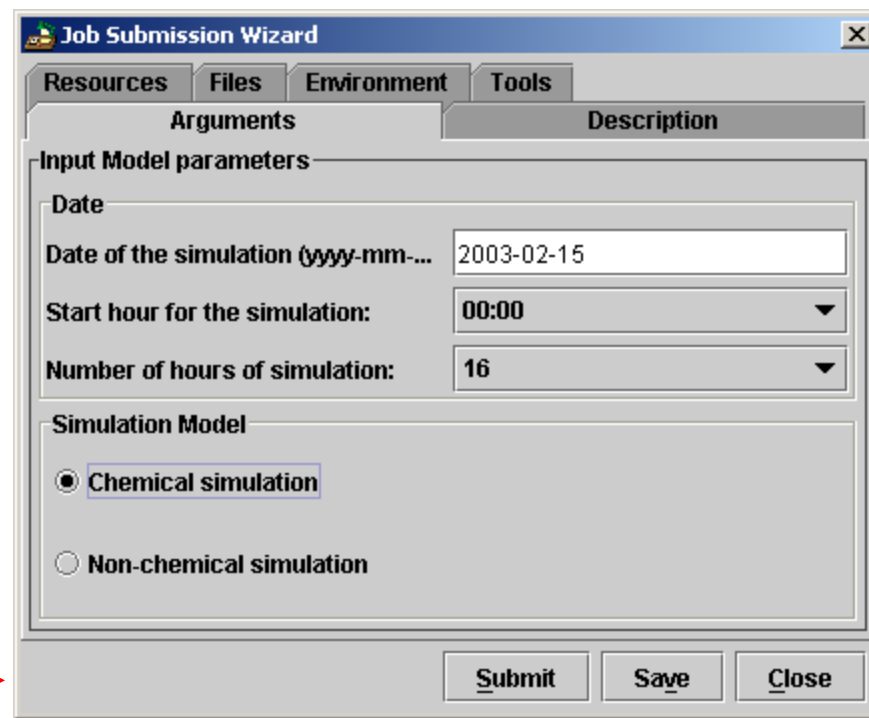
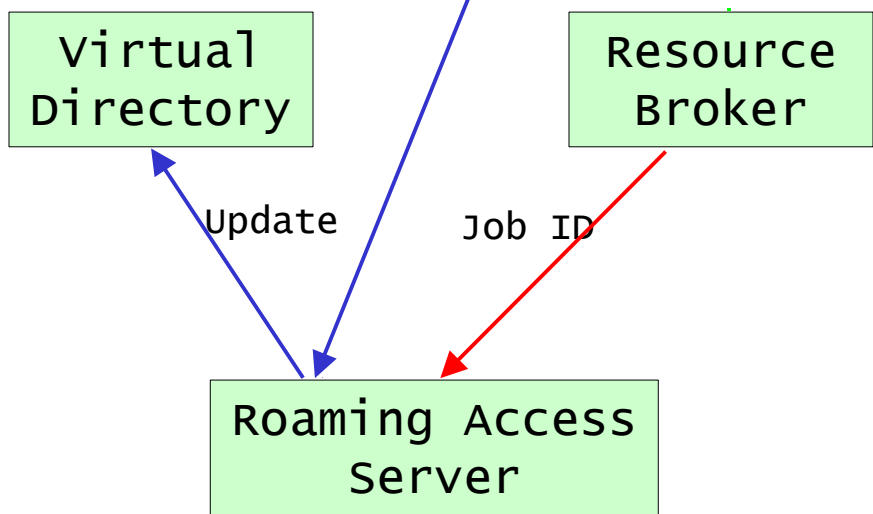
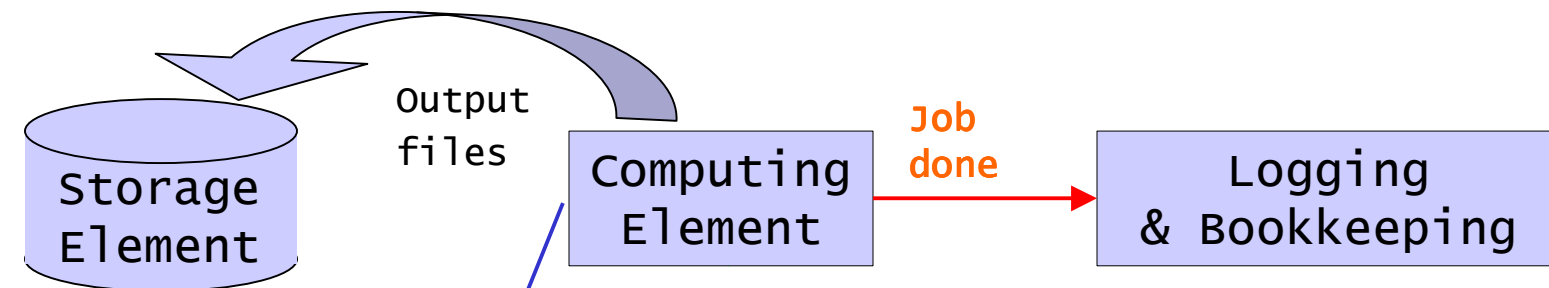
Data Management

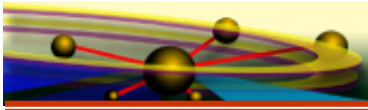
Supported protocols:
FTP, GridFTP, HTTP



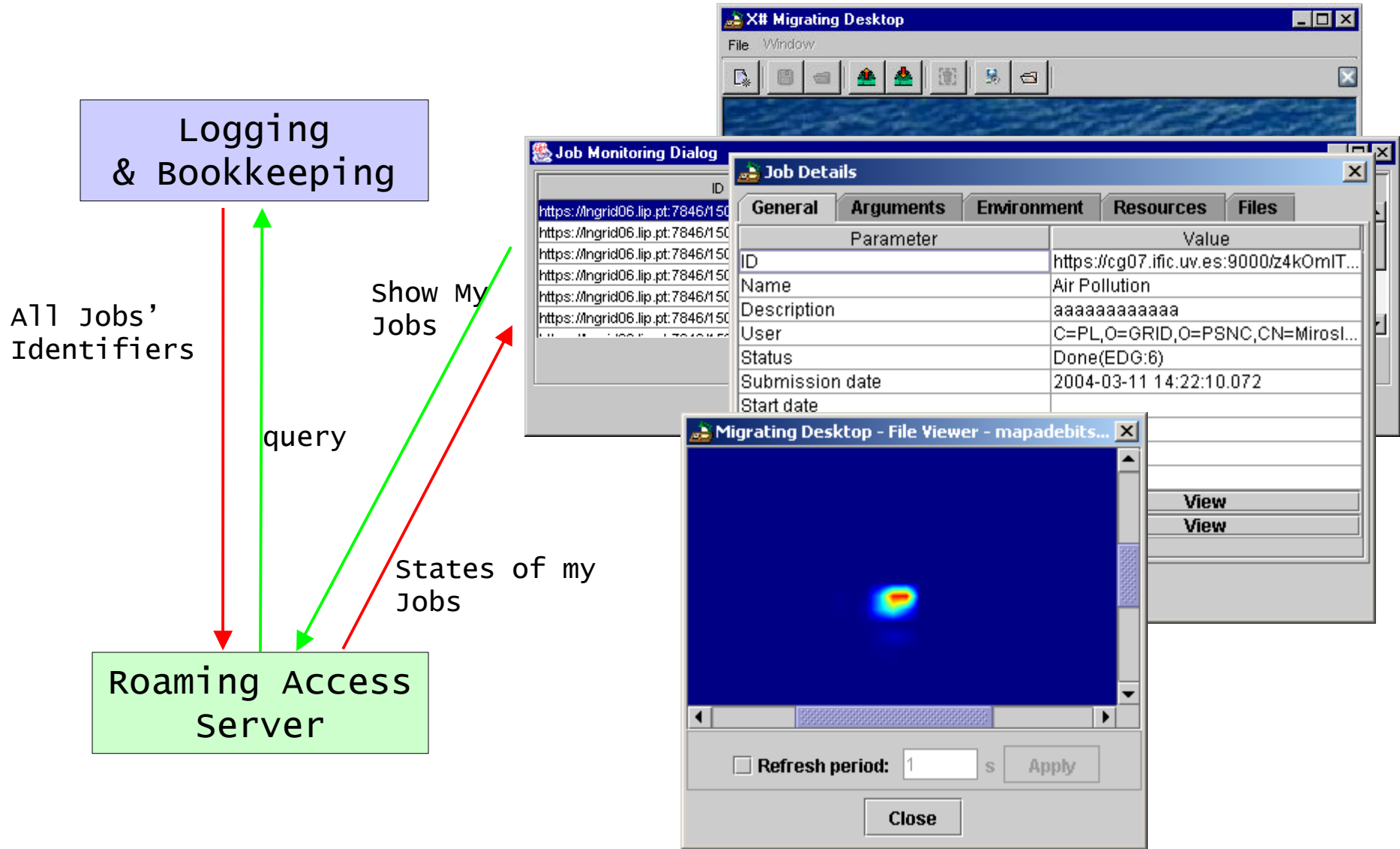


„Submission mechanism” - case of usage



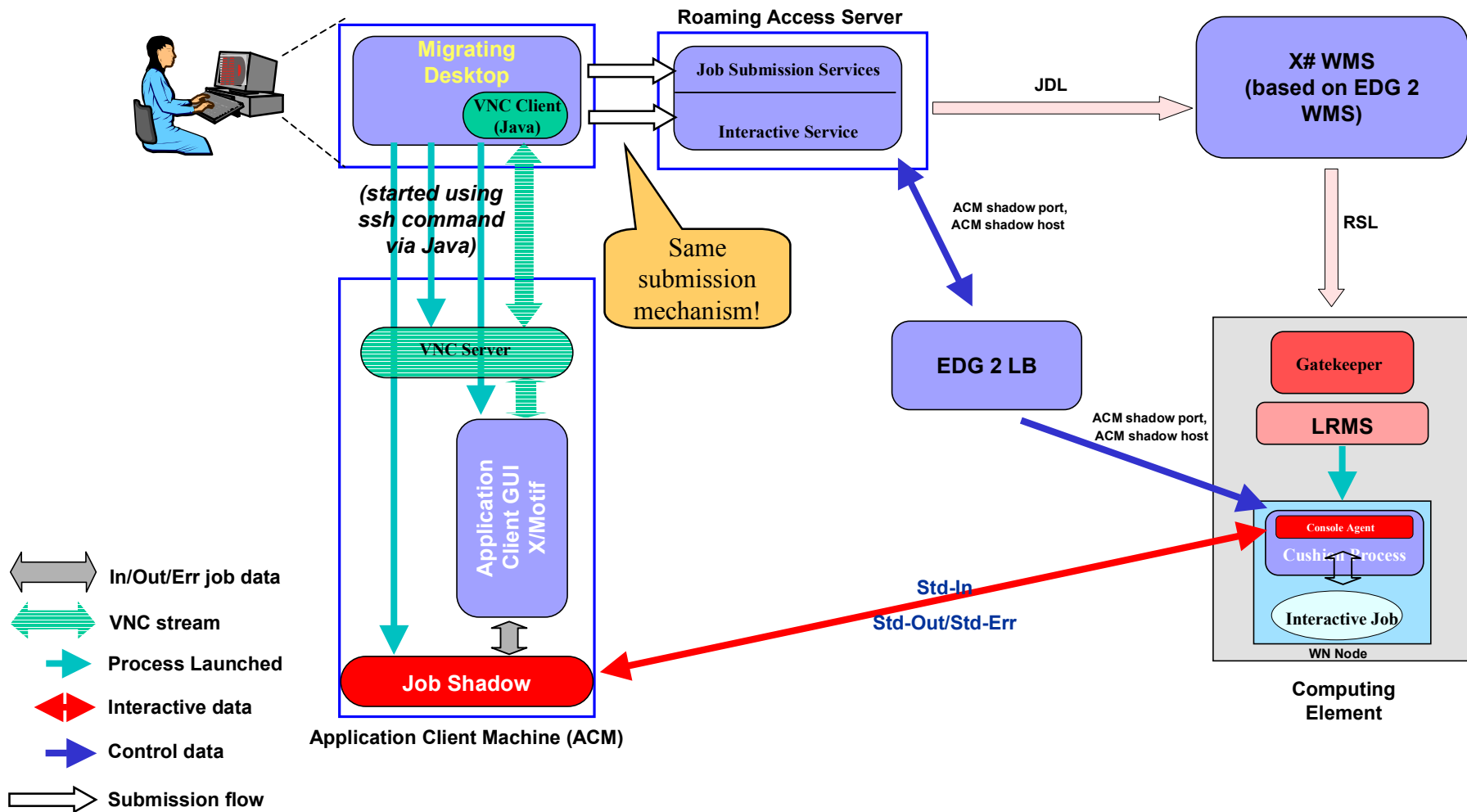


Job monitoring, retrieving of results



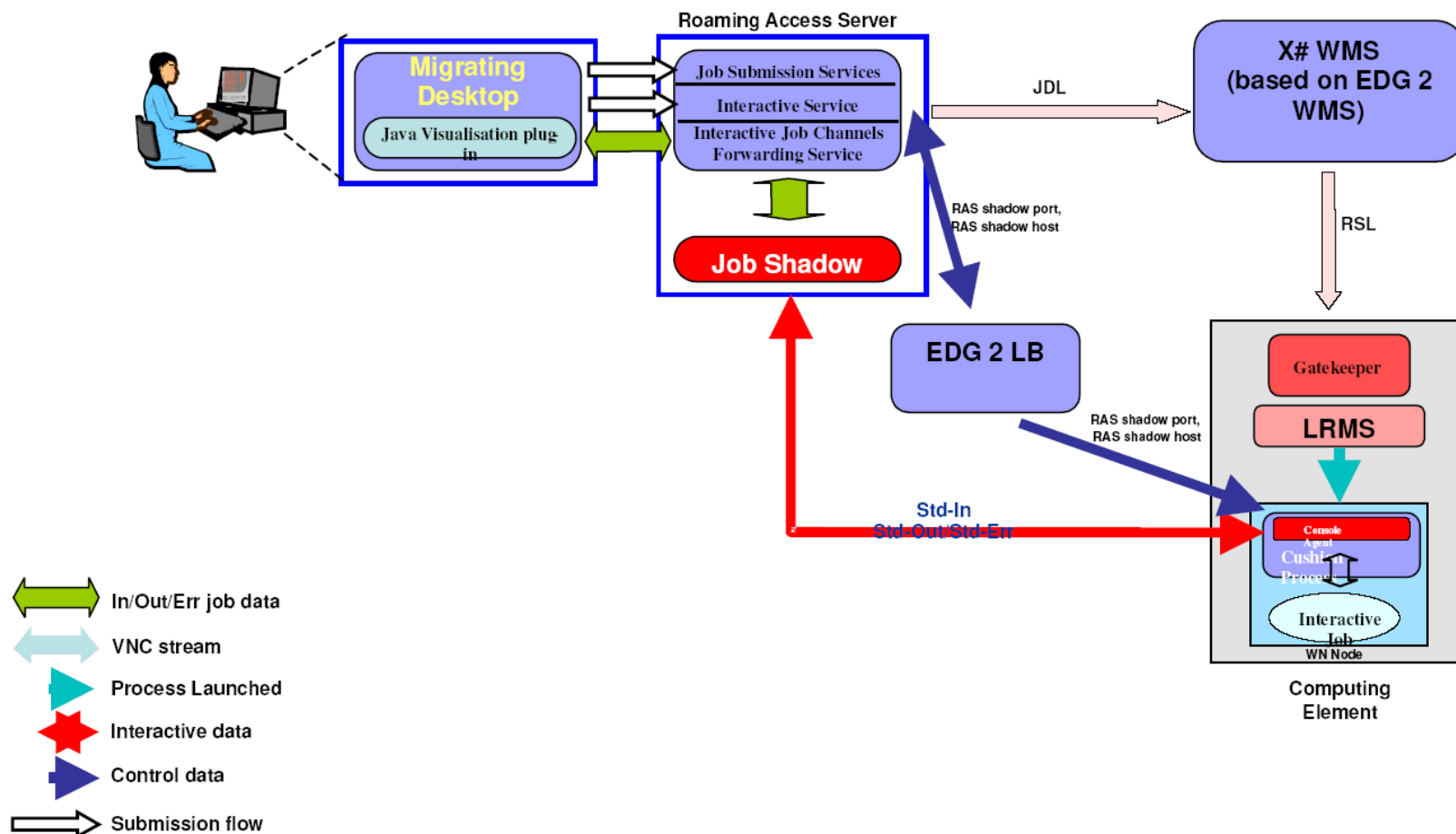
Functionality overview

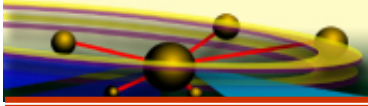
Interactive applications (for legacy client applications)



Functionality overview

Interactive applications (for java plugin applications)





Conclusions

- MD provides work environment to mobile users in any location, independently of a hardware platform and the operating system
- It is a multi-purpose tool
- A flexible system structure enables defining and adaptation requirements of individual groups of users
- The license is Open Source
- See the demo:
<http://willow.crossgrid.man.poznan.pl/crossgrid>