



Enabling Grids for E-scienceE

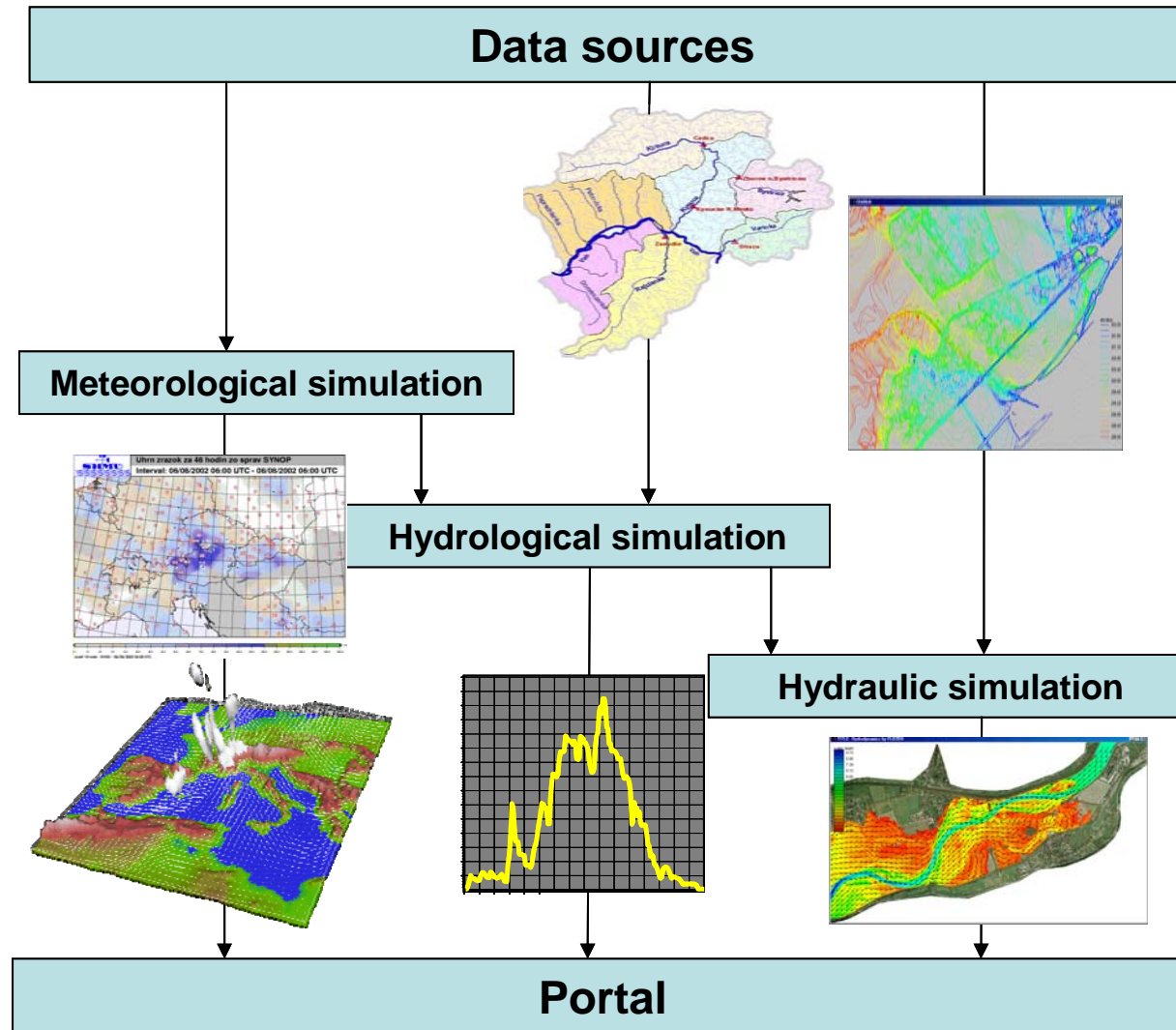
# Flood application on gLite

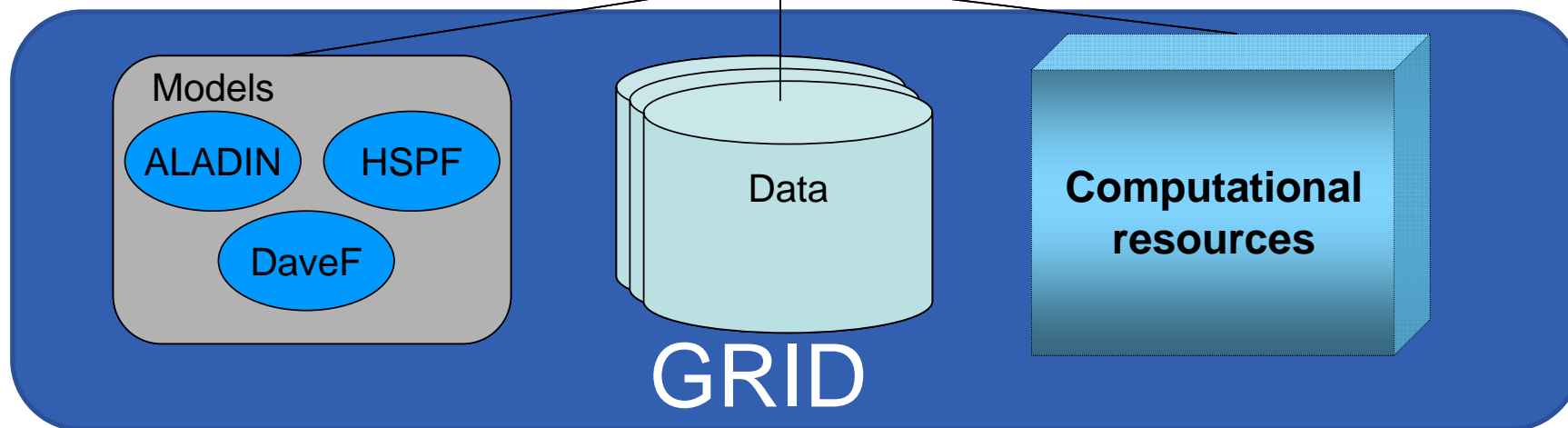
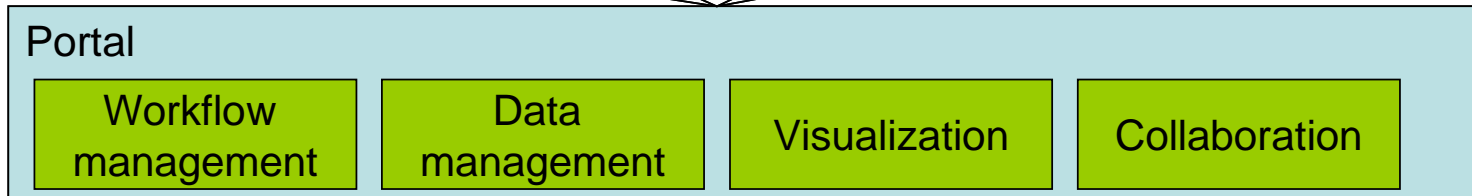
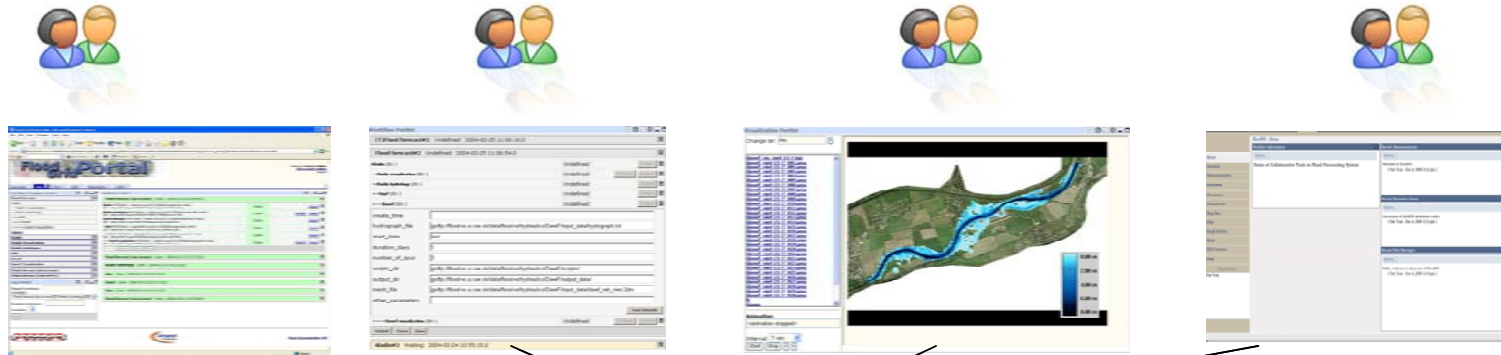
*Viet D. Tran, Ladislav Hluchy  
Institute of Informatics, SAS  
Slovakia*

[www.eu-egee.org](http://www.eu-egee.org)



- **Flood application is continually developed in**
  - ANFAS: data fusion for Flood Analysis and decision Support, (2000-03) IST-1999-11676
    - Data fusion, hydraulic modeling
    - Cluster computing
    - Remote processing
  - CrossGrid: Development of Grid Environment for Interactive Applications (2002-05) IST-2001-32243
    - More models (meteorology, hydrology)
    - Grid computing
    - Metadata catalog
    - Portal
  - EGEE: Enabling Grids for E-science (2004-2006) INFISO-RI-508833
    - Porting to gLite
    - Working in Earth Science Research Virtual Organization (ESR VO)
- **Collaboration with Slovak Hydro-meteorological Institute (SHMI) and Slovak Water Research Institute (WRI)**





- **Manages and executes jobs with data dependences**
- **Cooperates with gLite resource broker to find suitable computing element for running simulation**
- **Monitors status of jobs**
- **Abilities to use predefined workflow templates, spawning running workflow, modifying parameters of jobs**

Workflow Portlet

(T)Flood forecast#1 Undefined 2004-02-25 11:06:16.0

Flood forecast#2 Undefined 2004-02-25 11:06:54.0

Aladin (ID: )	Undefined	Output
• Aladin visualization (ID: )	Undefined	Pictures Output
• Aladin hydrology (ID: )	Undefined	Output
• • Hspf (ID: )	Undefined	Output
• • • Davef (ID: )	Undefined	Output

create\_time

hydrograph\_file gsiftp://flood-vo.ui.sav.sk/data/flood-vo/hydraulics/DaveF/input\_data/hydrograph.txt

start\_date last

duration\_days 1

number\_of\_cpus 3

scripts\_dir gsiftp://flood-vo.ui.sav.sk/data/flood-vo/hydraulics/DaveF/scripts/

output\_dir gsiftp://flood-vo.ui.sav.sk/data/flood-vo/hydraulics/DaveF/output\_data/

mesh\_file gsiftp://flood-vo.ui.sav.sk/data/flood-vo/hydraulics/DaveF/input\_data/davef\_vah\_river.2dm

other\_parameters

load defaults

• • • • Davef visualization (ID: )	Undefined	Pictures Output
------------------------------------	-----------	-----------------

Submit Clone Save

Aladin#3 Waiting 2004-02-24 10:55:15.0

- **Many kinds of data in FloodGrid**
  - Meteorological, hydrological, hydraulic
  - Generated by simulations or obtained from sensors
  - Permanent or periodically updated
  - Publicly available or with restricted access
- **Using metadata catalog for describing data**
- **Data are store in storage elements and are accessed via Grid protocols**
- **Operation: query, adding, modification, deleting**

- **Multiple visualization modes according to models and visualization tools**
  - Texts
  - Pictures
  - Animations
  - Virtual reality



Visualization Portlet

Change dir: /vis

- davef vis viet-21-7.tgz
- davef viet-21-7 001.png
- davef viet-21-7 002.png
- davef viet-21-7 003.png
- davef viet-21-7 004.png
- davef viet-21-7 005.png
- davef viet-21-7 006.png
- davef viet-21-7 007.png
- davef viet-21-7 008.png
- davef viet-21-7 009.png
- davef viet-21-7 010.png
- davef viet-21-7 011.png
- davef viet-21-7 012.png
- davef viet-21-7 013.png
- davef viet-21-7 014.png
- davef viet-21-7 015.png
- davef viet-21-7 016.png
- davef viet-21-7 017.png
- davef viet-21-7 018.png
- davef viet-21-7 019.png
- davef viet-21-7 020.png
- davef viet-21-7 021.png
- davef viet-21-7 022.png
- davef viet-21-7 023.png
- davef viet-21-7 024.png
- davef viet-21-7 025.png
- davef viet-21-7 026.png
- davef viet-21-7 027.png
- davef viet-21-7 028.png
- davef viet-21-7 029.png
- davef viet-21-7 030.png
- h
- d.png

Animation

<animation stopped>

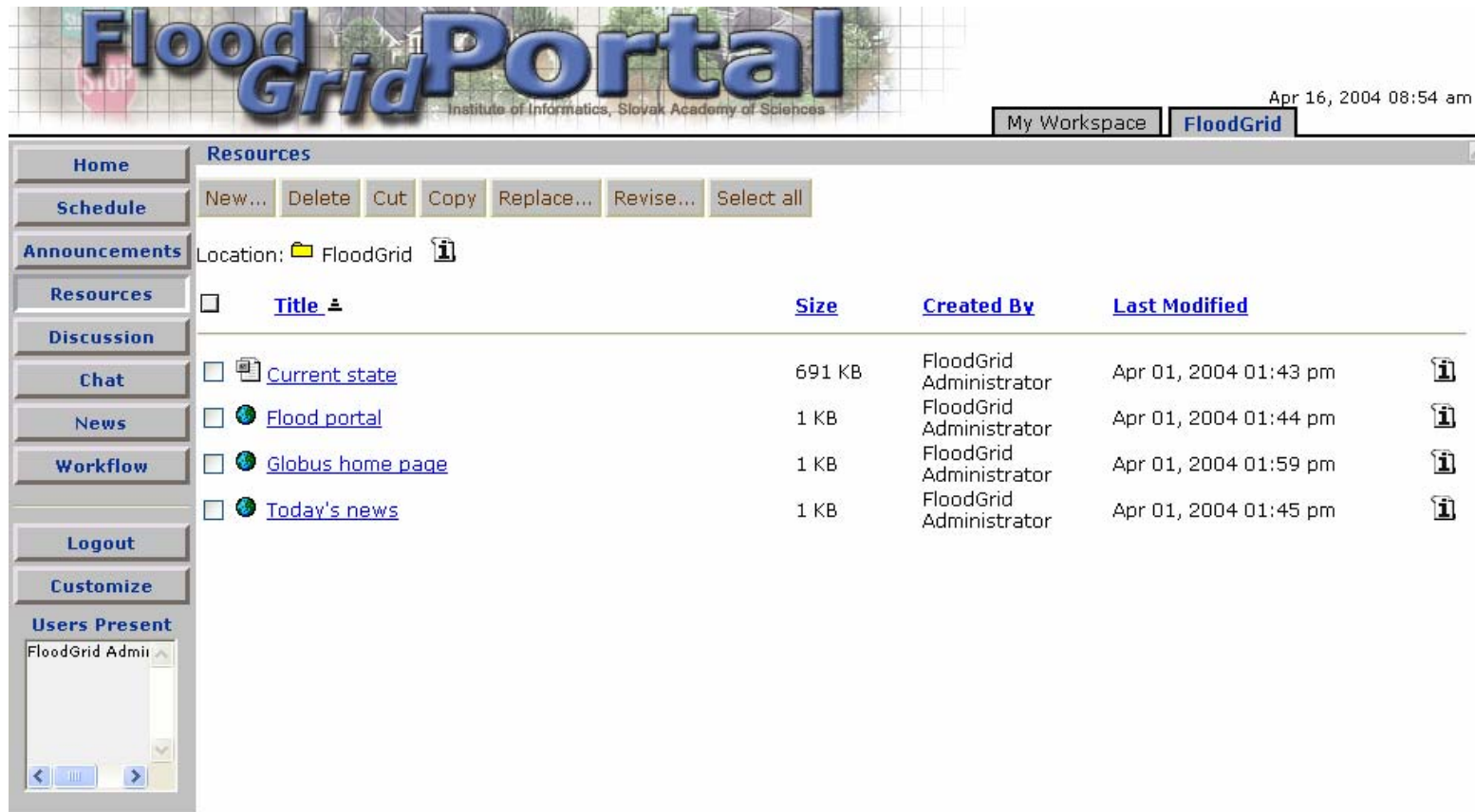
Interval: 1 sec

Start Stop < >

A 3D visualization of a river and surrounding land. The river is shown in a dark blue color, indicating a depth of 0.00 m. The surrounding land is shown in a light blue color, indicating a depth of 8.00 m. The map is overlaid on a satellite-style image of the terrain. A color scale legend is located in the bottom right corner of the visualization area, showing a gradient from light blue (0.00 m) to dark blue (8.00 m).

Color	Depth (m)
Light Blue	0.00
Medium Blue	2.00
Dark Blue	4.00
Very Dark Blue	6.00
Black	8.00

- **Different users groups (experts in meteorology, hydrology, hydraulics, crisis team, river authorities) need to collaborate on flood application**
- **Portal provides different means of communication among users: chats, mailing lists, discussion groups, file sharing**
- **Multiple communication channels, access control for every channel**
- **Collaboration via other shared tools of portal**





**FloodGrid Portal**  
Institute of Informatics, Slovak Academy of Sciences










Apr 16, 2004 08:54 am

My Workspace | **FloodGrid**

**Resources**

New... Delete Cut Copy Replace... Revise... Select all

Location:  FloodGrid 

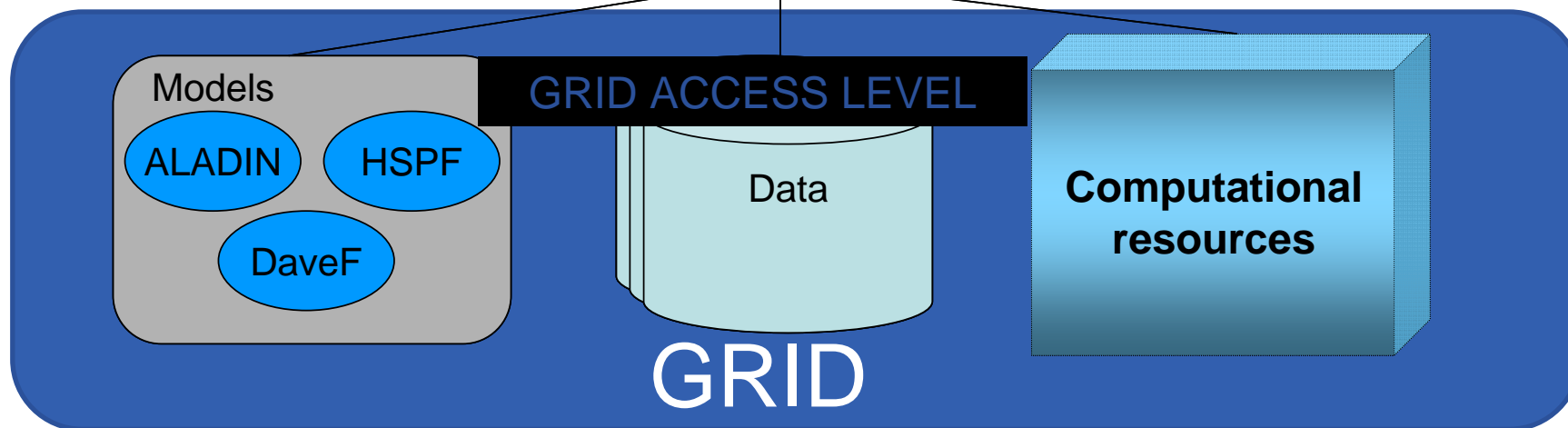
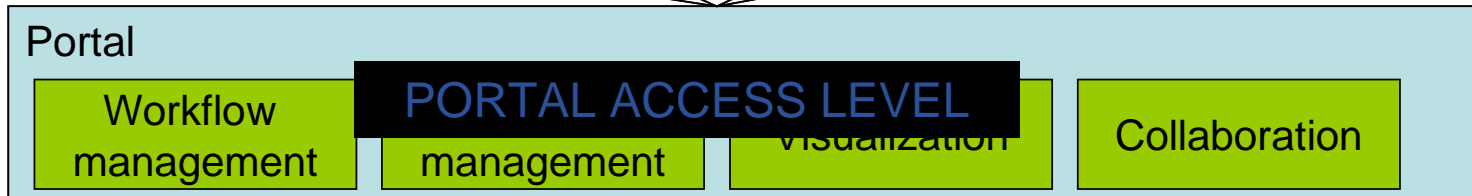
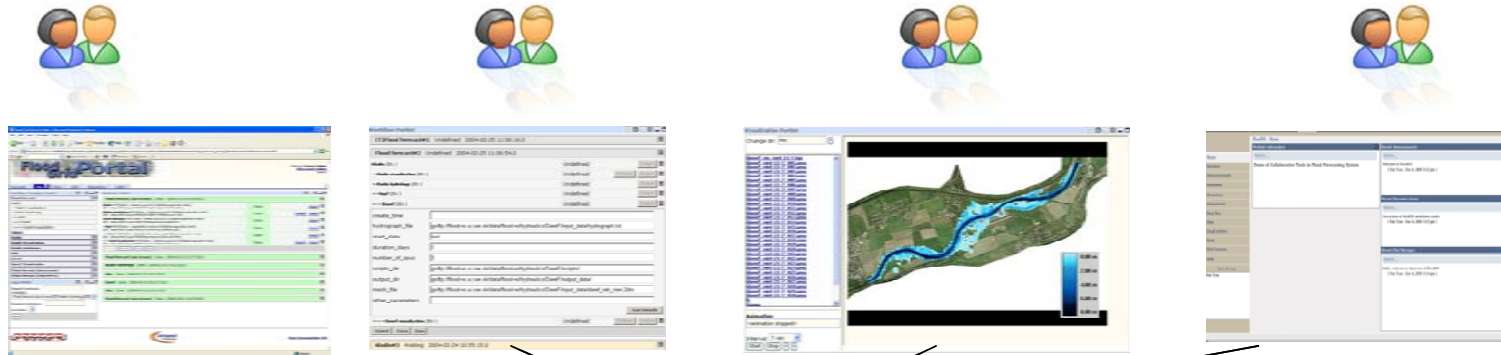
<input type="checkbox"/>	<u>Title</u>	<u>Size</u>	<u>Created By</u>	<u>Last Modified</u>	
<input type="checkbox"/>	 <a href="#">Current state</a>	691 KB	FloodGrid Administrator	Apr 01, 2004 01:43 pm	
<input type="checkbox"/>	 <a href="#">Flood portal</a>	1 KB	FloodGrid Administrator	Apr 01, 2004 01:44 pm	
<input type="checkbox"/>	 <a href="#">Globus home page</a>	1 KB	FloodGrid Administrator	Apr 01, 2004 01:59 pm	
<input type="checkbox"/>	 <a href="#">Today's news</a>	1 KB	FloodGrid Administrator	Apr 01, 2004 01:45 pm	

**Users Present**

FloodGrid Admin

| [CrossGrid main site](#) | [CrossGrid testbed](#) | [II SAS](#) | [OGCE](#) |

- **Two level of securities: Portal level and Grid level**
- **Portal level:**
  - Secure HTTP access
  - Authentication by passwords
  - Access controls for every tools/resources at portal (individually or by groups)
  - Only for accessing tools/resources located on portal. For accessing physical data, models or computing resource, Grid certificates are needed
- **Grid level:**
  - Authentication by Grid certificates provided by certificate authorities
  - Using secure Grid communication protocols



- **Requirement: Different user groups (experts, river authorities, crisis team, public) have different access rights to resources**
- **gLite provides solutions for this problem**
  - VOMS with different access rights for different user groups
  - ACL (Access Control List) support for data management
- **Job submission has been ported to gLite**
- **Data management will be next**