

Virtual Organization for Energy Problems Solving in European GRID

Crew:

V. Evdokymov
O. Chemerys
A. Davydenko
S. Hilgurt
V. Dusheba
S. Reznikova



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Content

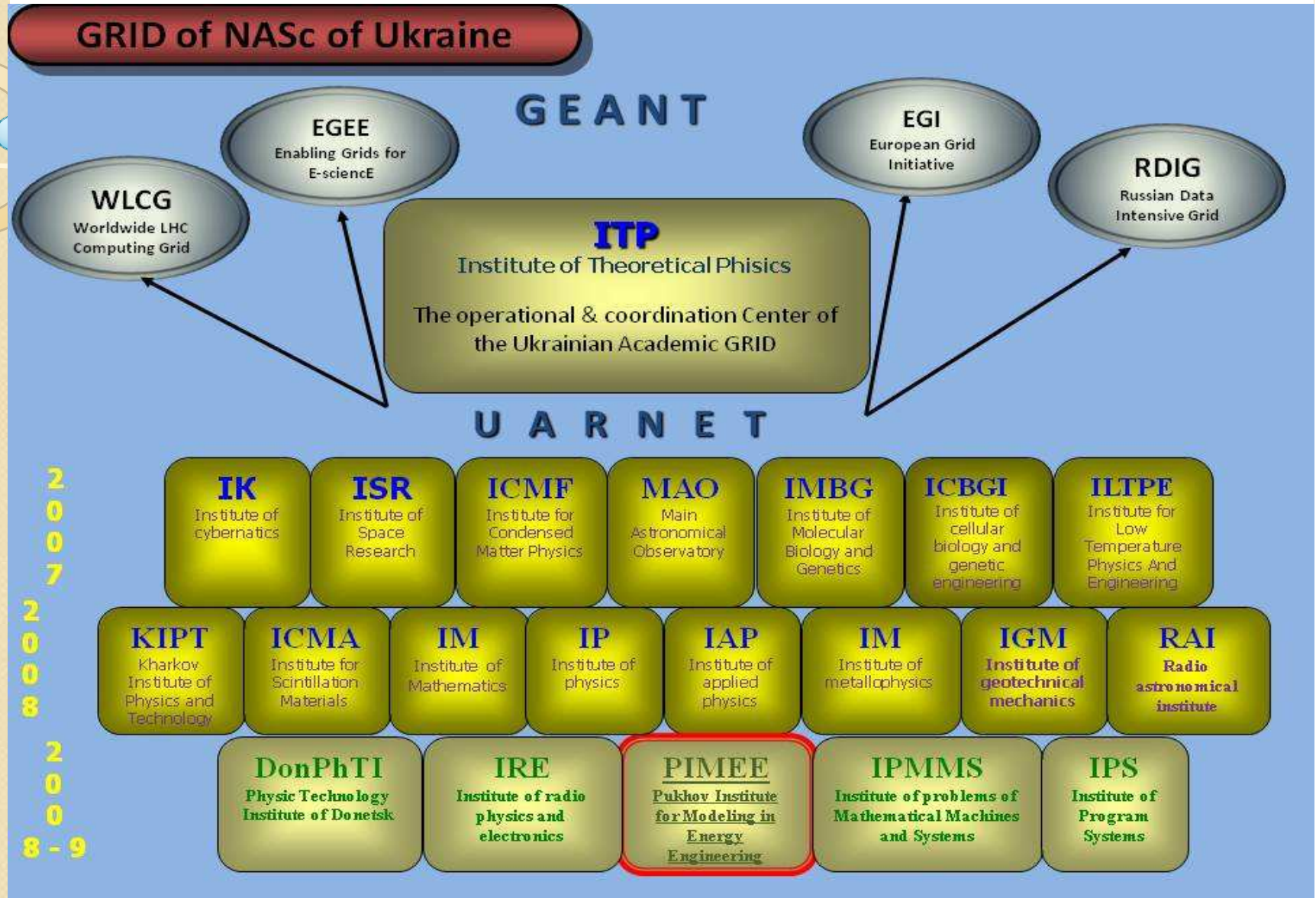
- Introduction – parallel computing is our future
- What is GRID?
- GRID in National Academy of Sciences of Ukraine
- Ukrainian GRID initiative
- Recourses of PIMEE
- Problems of Energy Engineering
- Business proposal

What is GRID?

Wikipedia:

Grid computing (or the use of computational grids) is the application of several computers to a single problem at the same time – usually to a scientific or technical problem that requires a great number of computer processing cycles or access to large amounts of data.

It is a form of distributed computing whereby a "super and virtual computer" is composed of a cluster of networked, loosely coupled computers, acting in concert to perform very large tasks.



What is doing in NASc of Ukraine for GRID

High Energy Physics

Processing and analysis of experimental data of accelerator LHC (CERN).

Astrophysics and astronomy

Dynamic computing of star concentration evolution in external field of galaxy.
Hydrodynamic modeling of collision and fragmentation of molecular clouds.
The analysis of algorithm N-body and parallel calculation on GRAPE clusters.
Processing and the theoretical analysis of the given supervision space x-ray and scale of the radiation, arriving from satellite telescopes INTEGRAL, SWIFT and others.

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Biophysics and Biology

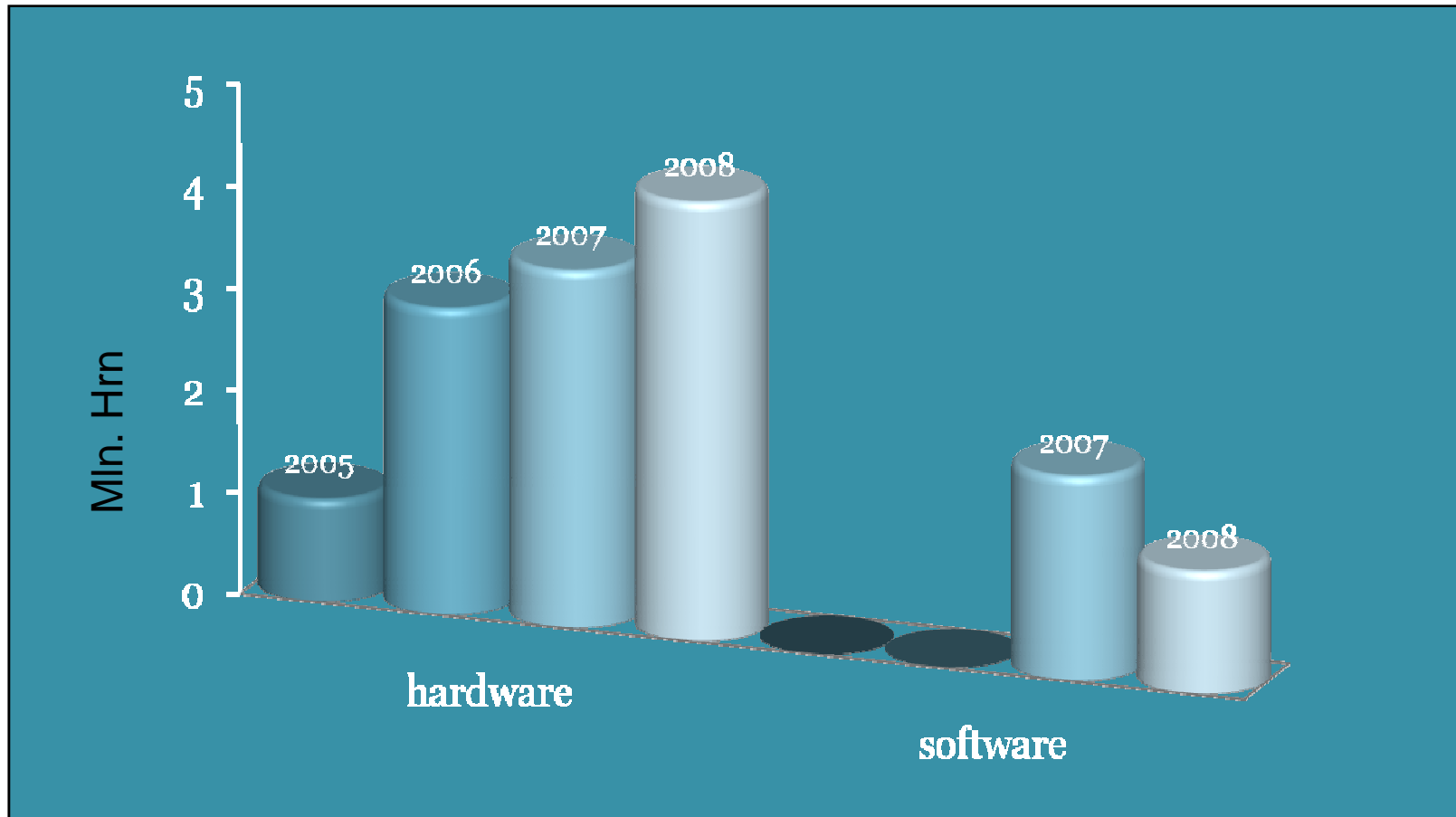
Calculations of thermodynamic characteristics, infra-red and electronic spectra of fragments of metalized DNA.
Research of structures of bio-nano-hybrid complexes.
Calculations of molecular dynamics of complexes of fibers with low-molecular connection.

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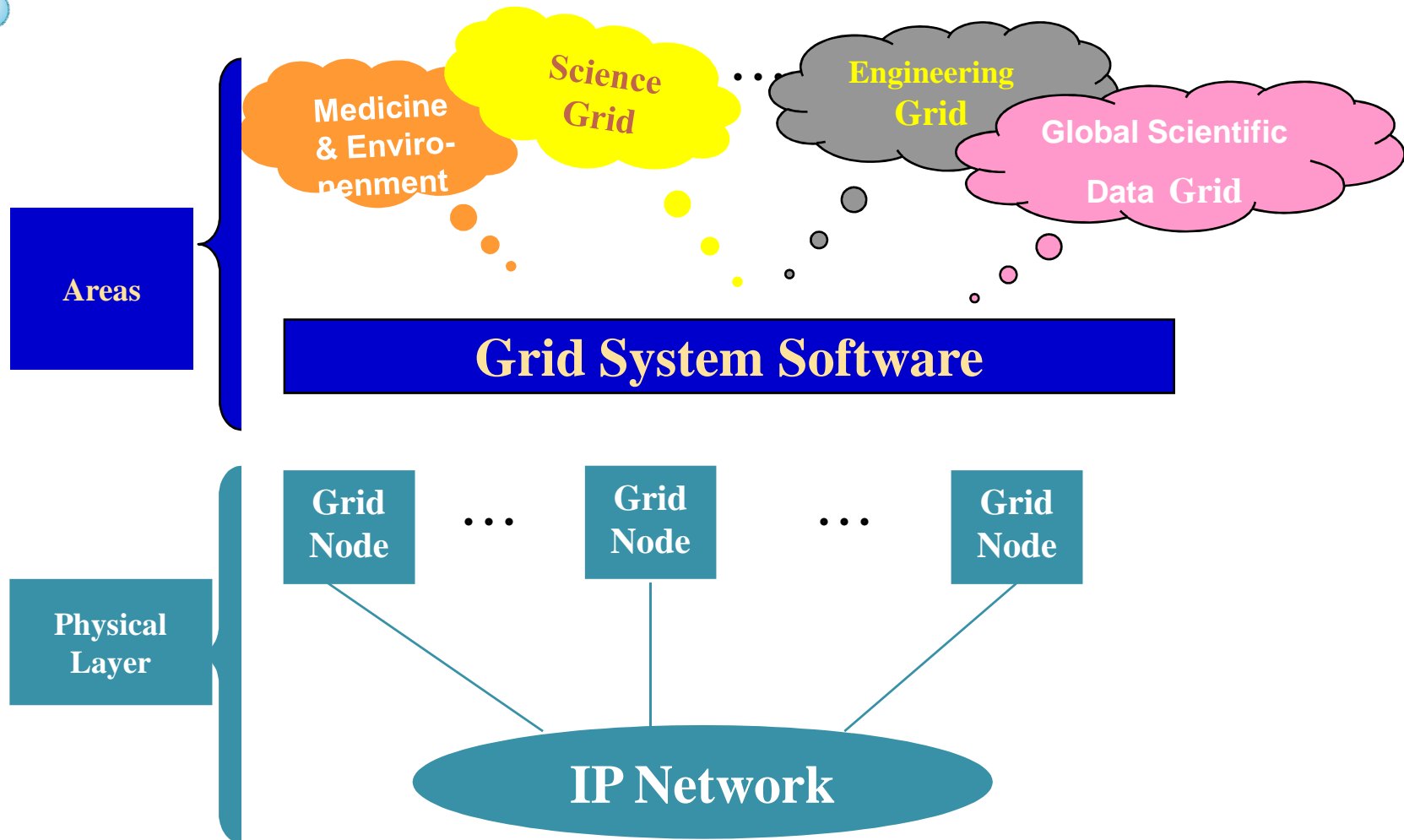
Ecology Monitoring ,Analysis and Modeling of Environment

The forecast of weather parameters for Ukraine by means of numerical modeling.

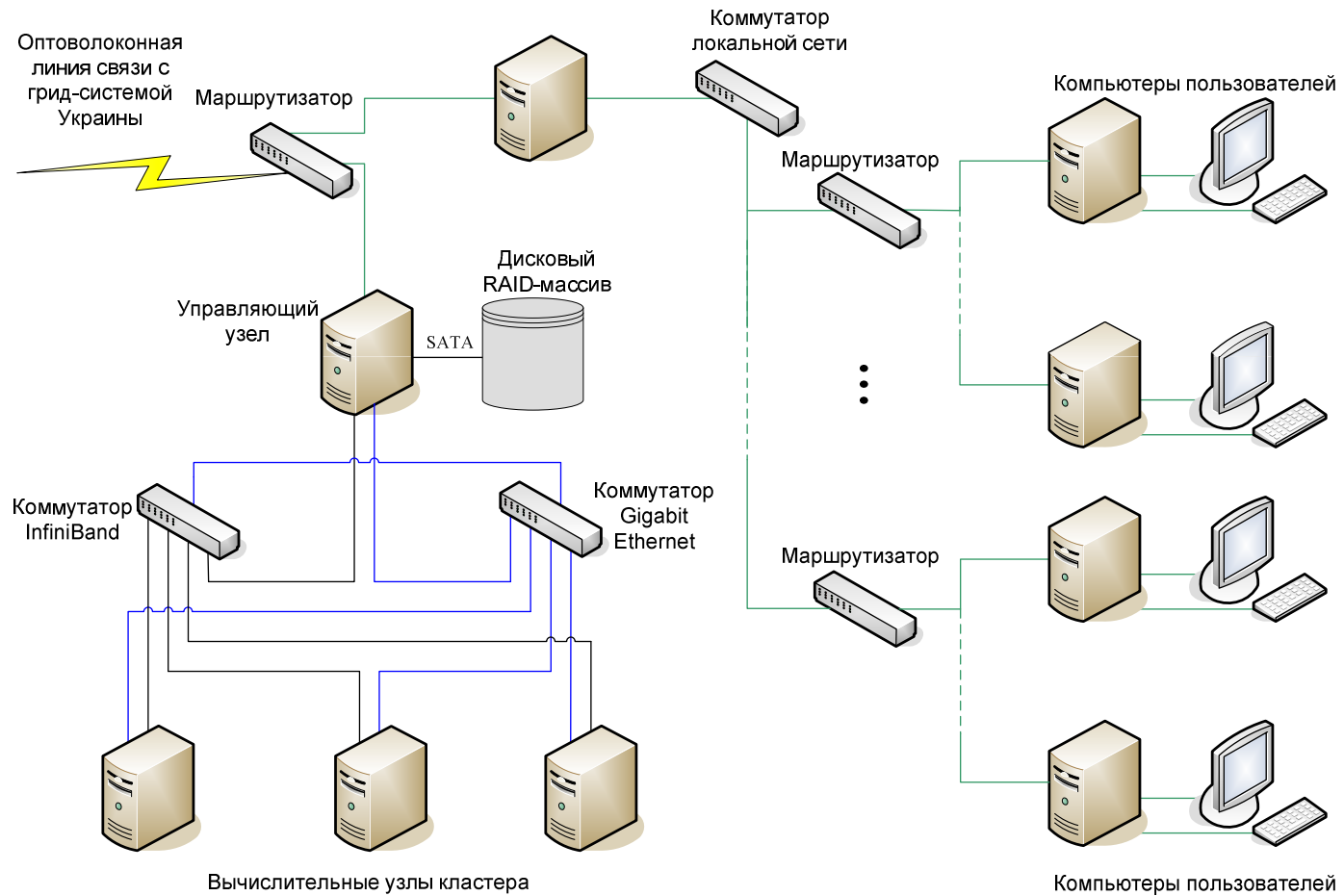
Financial Support of NASc's GRID



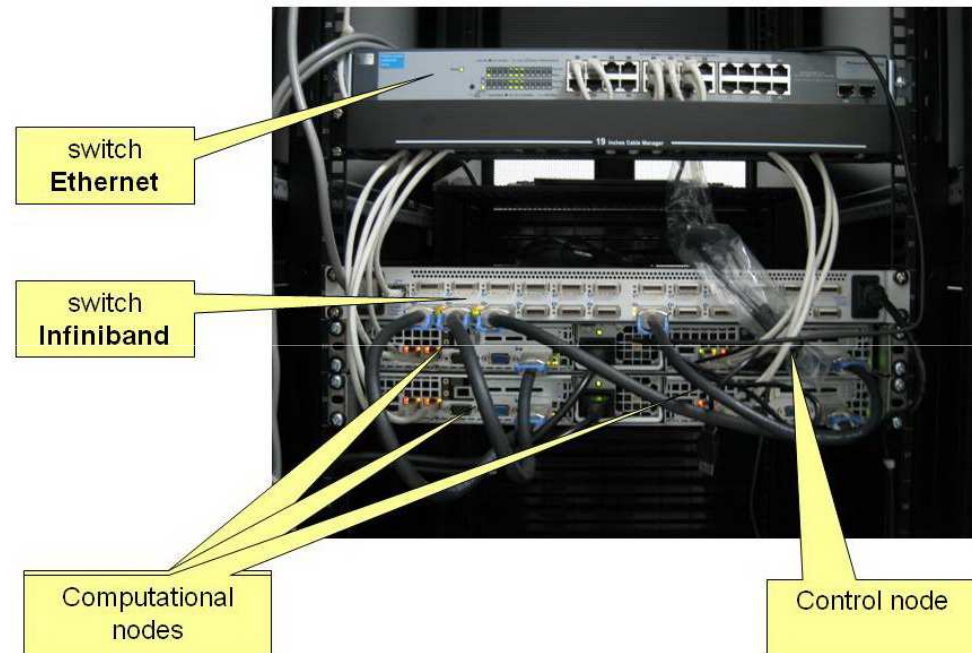
Ukraine National GRID Initiative (UNGI)



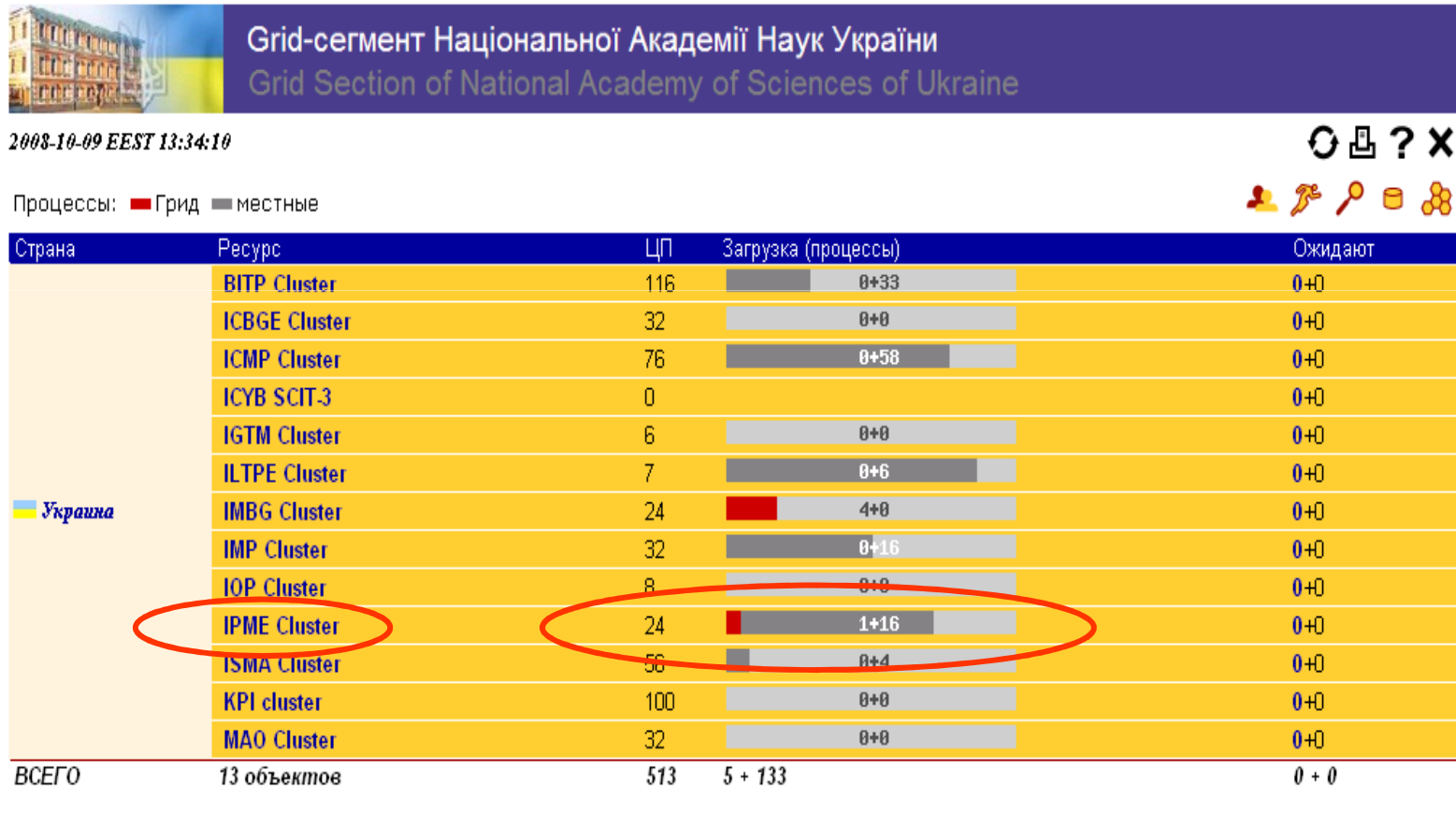
The Structure of PIMEE's Cluster



energrid.ipme.kiev.ua



Monitoring of UAG (lcg.bitp.kiev.ua)



Main Technical Indexes of PIMEE Cluster

Type of interconnect – Infiniband

(the most powerful for today)

Number of processors (cores) – 24

RAM – 24 Gb

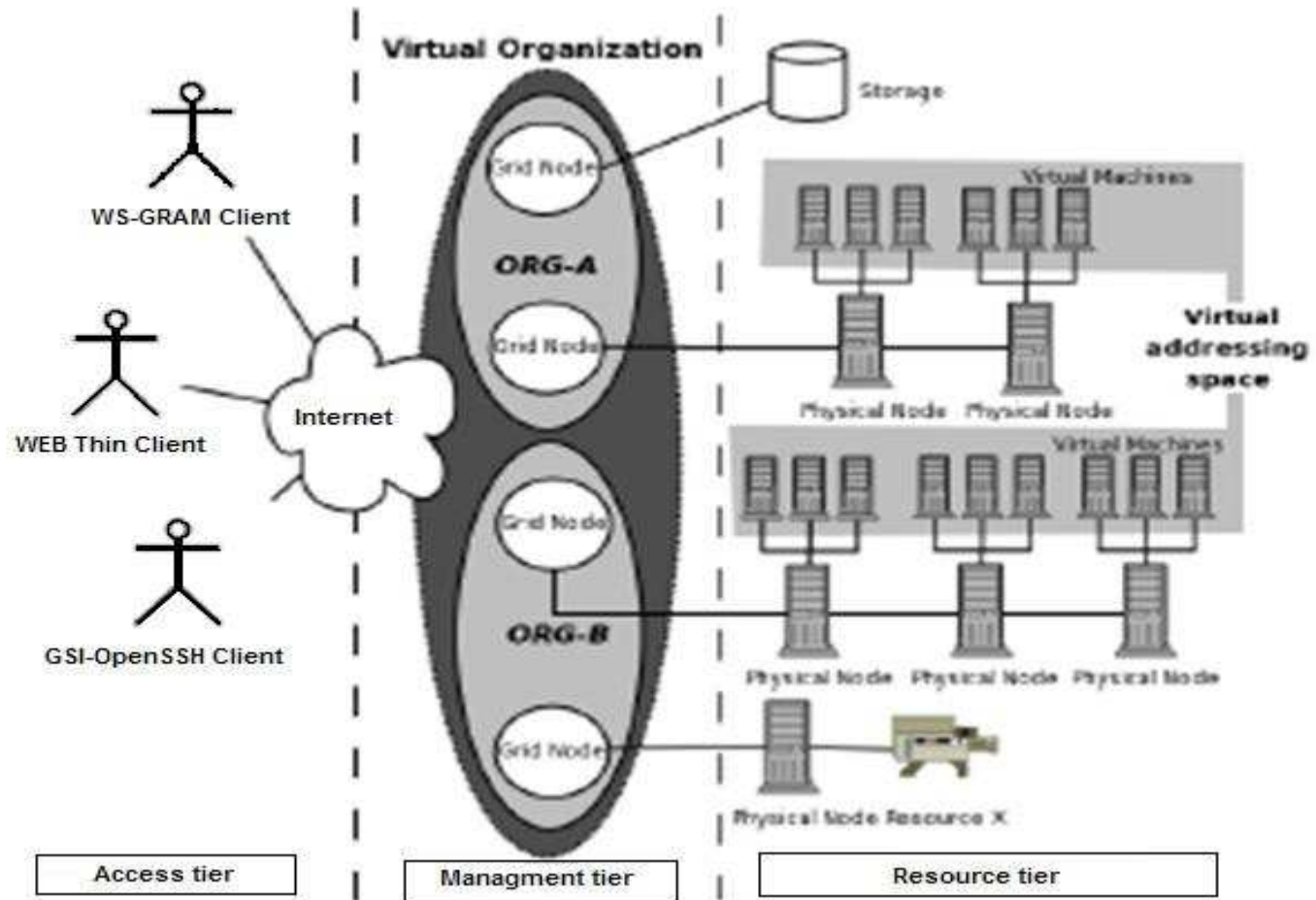
(in calculation nodes which are available for GRID)

HDD space – 500 Gb

Peak performance – 192 GFlops

Problems of Energy Engineering

- **modeling of problems of power: electro-power network objects and their modes, pipeline systems, the problems connected with power consumption, etc.;**
- **development of expert systems and decision-making systems;**
- **ecological analysis, monitoring and modeling of environment and industrial influence on it; □**
- **modeling of economical problems for the analysis and forecasting of regional economic development**



Proposals for Cooperation

To create the virtual organization for energy engineering problems solving in the frame of European GRID

Managerial tasks

- Create strategic line
- Development of VO documents
- Registration and certification
- Promotion
-

Technological tasks

- Connect resources
- Select problems to be solved
- Development programs and GUI
- Testing and verification
- To prove the performance, power and usability of software
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Thank for your attention!



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

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