



Научно-техническая программа Союзного государства "СКИФ-ГРИД"

# "SKIF-GRID" SUPERCOMPUTING PROJECT OF THE UNION STATE OF RUSSIA AND BELARUS

## IMPLEMENTATION OF GRID COMPONENT

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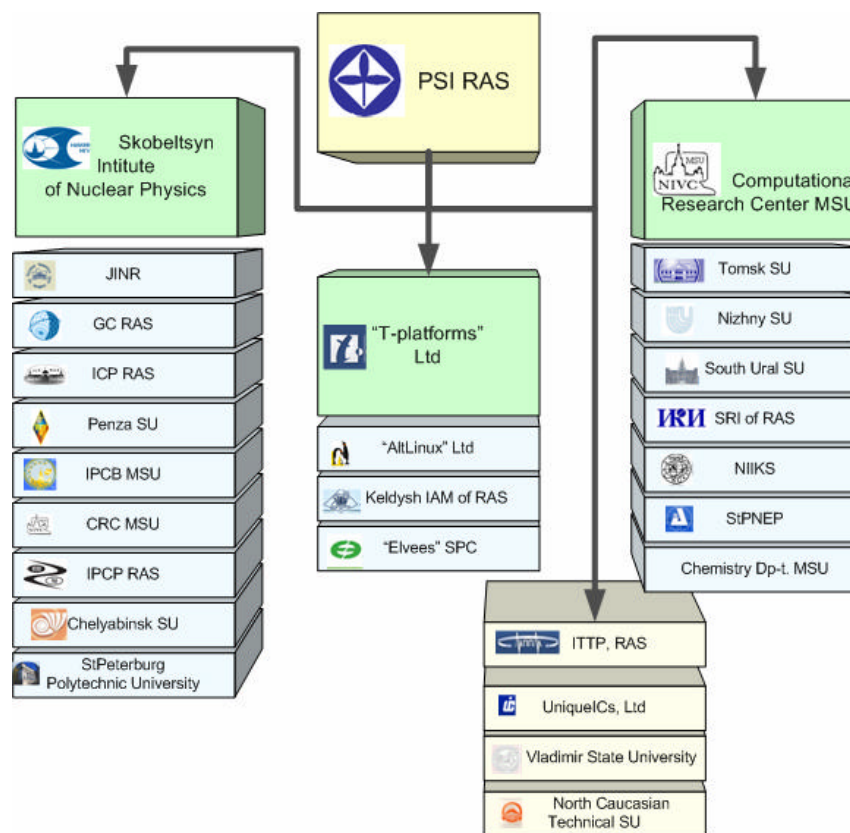
## "SKIF-GRID" PROJECT TIMELINE

1. **June 2004** – first proposal filed for "SKIF-GRID" project
2. **March 2007** – approved by Government of the Union State
3. **May-June 2007** – consortium formation (for 2007-2008)
4. **July 2007** – all contracts signed
5. **March 2008** - SKIF-MSU supercomputer deployed
6. **May 2008** - "SKIF-Testbed" federation created.

# PROJECT ORGANIZATION: 2007-2008

## Project directions

1. Grid technology
2. Supercomputers
  - SW
  - HW
3. Security
4. Pilot projects – applications of HPC and grid technology





## «SKIF MSU»





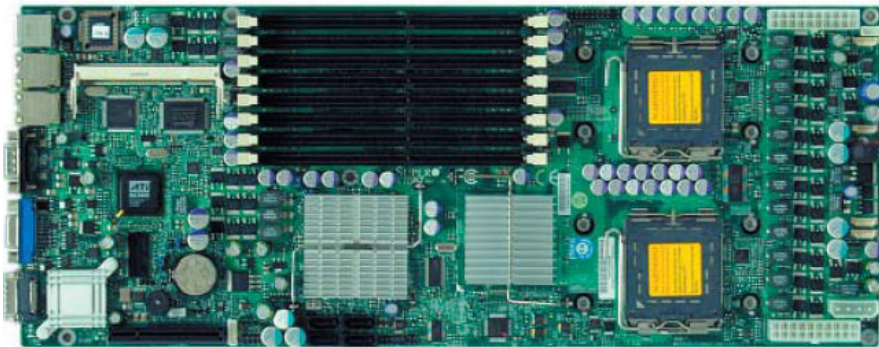
## SKIF MSU

- Theoretical peak performance  
**60 TFlops**
- Advanced clustering solutions:
  - diskless computational nodes
  - Original blade design

Parameter	Value
CPU architecture:	x86-64
CPU model:	Intel XEON E5472 3,0 GHz (4-cores)
Nodes (dual CPU)	625
CPU cores total	5 000

## Blade-modules

- CPU: 2x Intel XEON "Clovertown/Harpertown"
- RAM: 8 slots 667 / 533MHz FB-DIMM
- Chipset: Intel 5400 (Seaburg)
- HDD: up to 2 SATA 2.5" disks
- Ethernet: 2 x Gigabit Etherhet
- Extention slots: standard PCI-Express 8x



## «SKIF-Testbed»

- Federation of 8 HPC centers
- 3 computers in Top 500
- ~100 TFlops peak





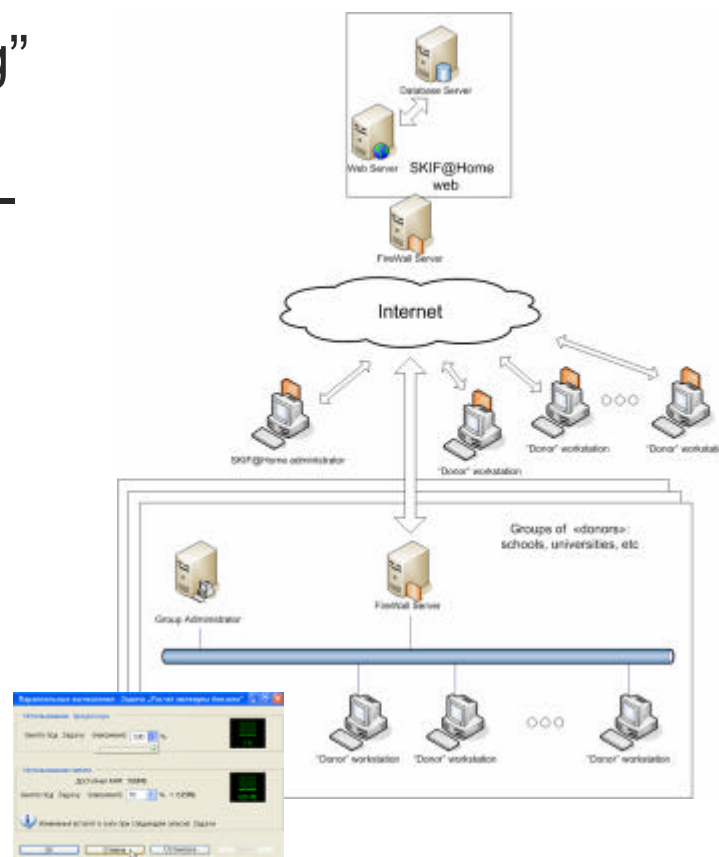
## Middleware platform – UNICORE 6.1

- X.509 for security
- Certificate Authority at Pereslavl-Zalesky (PyCA)
- Site platform
  - UNICORE 6.1
  - Java 1.5
  - Linux
  - Torque
- Experimental sites: UNICORE is complemented with additional services/modules



## «SKIF@Home»

- Goal – build “cycle harvesting” network to complement supercomputers, offload high-throughput tasks from expensive HPC hardware
- Facilitate usage in schools, colleges
- Virtual machine technology
- Now in testing mode: 22 machines in Pereslavl





## Applications

- HPC applications:
  - Drug design (MSU Belozersky Institute, SRCC, Chelyabinsk SU)
  - Inverse problems in sensing (SRCC)
  - Geoinformatics (Geophysical center RAS)
- Mammography database prototype (N.N. Semenov Chemical Physics Institute, RAS)
- Text mining (PSI RAS)
- Computational chemistry (MSU Chemistry department)
- Engineering (South Ural University ...)
- ...



## Future work: grid technology

- Meta-scheduling service (X-Com and/or UNICORE)
- OGSA-DAI: CDM/NetCDF datasources
- Cross-site storage (iRODS)
- Virtual clustering service: on-demand clusters, Xen.
- Integration with RDIG
  
- **2009-2010:**
  - Heterogeneous supercomputers in grid
  - Problem-solving grid environments



## "SKIF" Presentations on "Grid 2008"

- 30/06 18.00 - 18.30, M. Zhizhin, D. Medvedev, A. Poyda, D. Mishin  
GRID DATA MINING WITH CDM ACTIVE STORAGE
- 01/07 15.30 - 15.50, S.I. Sobolev  
NEW GENERATION ARCHITECTURE OF THE X-COM METACOMPUTING SYSTEM
- 01/07 7.00-17.15 V. Edneral, V. Ilyin, A. Kryukov, G. Shpiz, L. Shamardin,  
IMPLEMENTATION OF JOB SUBMISSION INTERFACE FROM EGEE/WLCG GRID  
INFRASTRUCTURE TO SKIF SERIES SUPERCOMPUTERS
- 02/07 12.30 - 13.00 A.V. Zhuchkov, N.V. Tverdokhlebov  
RUSSIAN DIGITAL MAMMOGRAPHY ARCHIVE IN GRID-ENVIRONMENT: NEW  
POSSIBILITIES AND OLD PROBLEMS
- 02/07 17.30 - 17.45 A.A. Moskovsky, A.Y. Pervin, B. Walker  
VIRTUAL APPLIANCES FOR GRID COMPUTING
- 03/07 10.00 - 10.30 A. Slepuhin (T-Platforms)  
HPC IN INDUSTRY



THANKS

**SKIF-GRID web site**

**<http://skif-grid.botik.ru>**