Lithuanian GRID – LitGRID

Infrastructure, activities, applications

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Outline

- How LitGRID project started
- LitGRID infrastructure
  - Project partners
  - Resources
  - Network
  - Middleware, CA
- Collaboration with BalticGRID project
- Applications
- Summary

About Lithuania

- Population: 3M+
- Universities, college: 25
- Research Institutes: 80+
- Students: 180K+

How LitGRID project started

- **2004 Oct.** Grid workshop at Vilnius University together with EGEE, CrossGRID, SweGrid dissimination teams.
- **2004 Dec**. VU-VGTU-KUT grid testbed (48 CPU) based on ARC middleware (*NorduGRID*). BGM cluster (8 CPU) has join Estonian Grid.
- **2005 Jan.** *NorduGrid* workshop in Tallinn. Discussions about NGI in Baltic States and BalticGrid.
- **2005 Jul.** **LitGRID infrastructure project was supported by Lithuanian Science and Studies Foundation (29 k€).**
- **2005 Oct.** Grid testbed (20 CPU) based on LCG v.2.6 middleware (EGEE).
- **2005 Nov.** BalticGrid project started. VU and ITPA – project partners from Lithuania.
- **2006 Jan.** **LitGrid project extention for 12 month. Budget 87k€.**

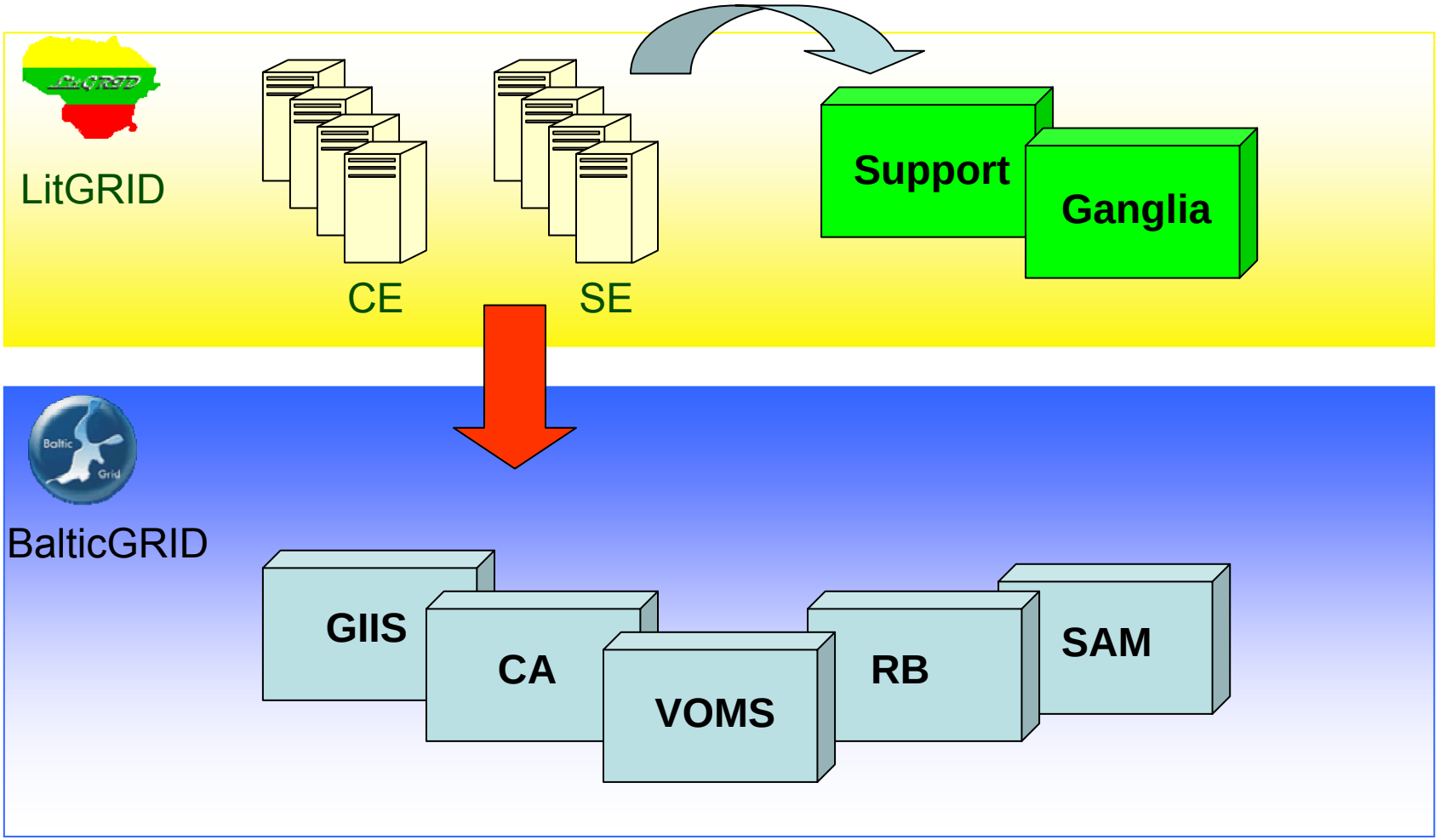
LitGRID partners

- **Vilnius University (coordinator)**
- Kaunas University of Technology
- Institute of Physics
- Vytautas Magnus University
- Institute of Biotechnology
- Klaipeda University
- Siauliai University
- Vilnius Gediminas Technical University
- Institute of Theoretical Physics and Astronomy
- Institute of Psychophysiology and Rehabilitation of KMU
- Institute of Mathematics and Informatics
- B.G.M. company – business partner

LitGRID objectives

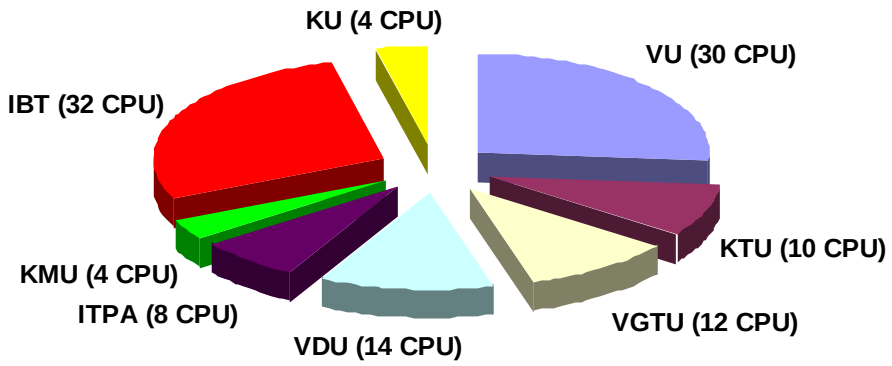
- Build computational grid infrastructure in Lithuania
- Integrate LitGRID infrastructure into BalticGrid and EGEE infrastructure
- Bring the knowledge in grid technologies and use of grids in Lithuania to a level comparable to that in EU member states with a longer experience in the development, deployment and operation of the grids.
- Gridification of major applications
- Engage Lithuanian scientists in grid standards and infrastructure development.

LitGRID infrastructure



Resources

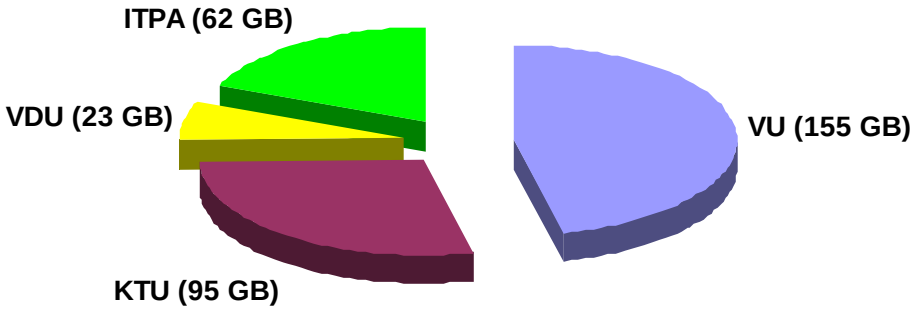
Computing Elements



Today:

8 sites: 114 CPU
335 GB

Storage Elements

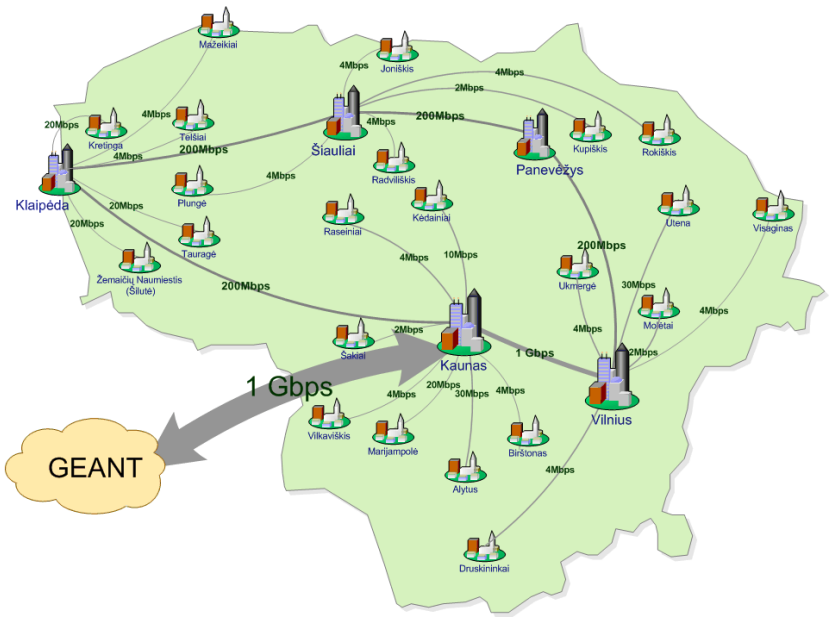


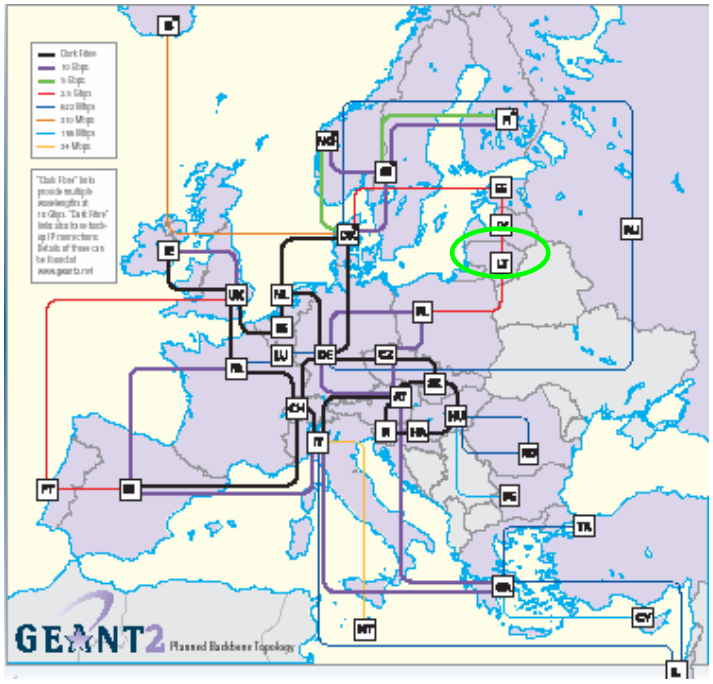
2007:

12 sites: ~300 CPU
~20 TB

Networking

LitGRID networking is based on Litnet infrastructure.





Lithuanian Academic and Research Network - Litnet

- 900+ academic, research and educational institutions of Lithuania
- 200K+ users

GRID middleware and software

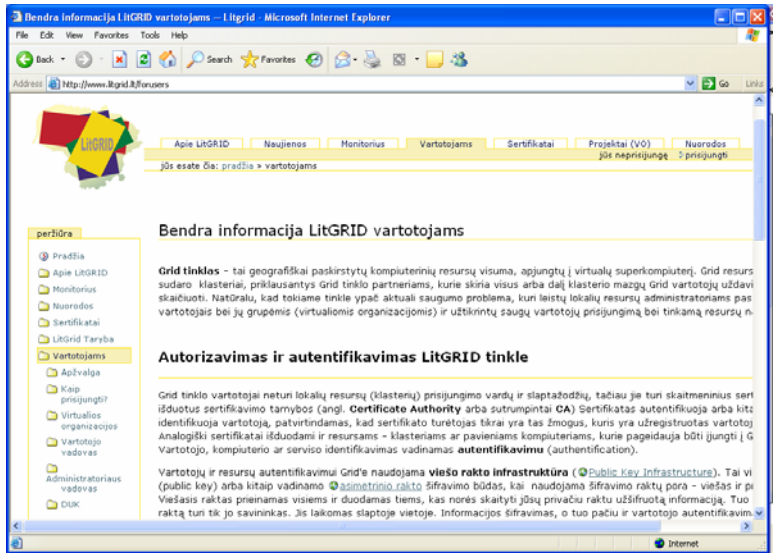
EGEE based middleware on *Scientific Linux* clusters

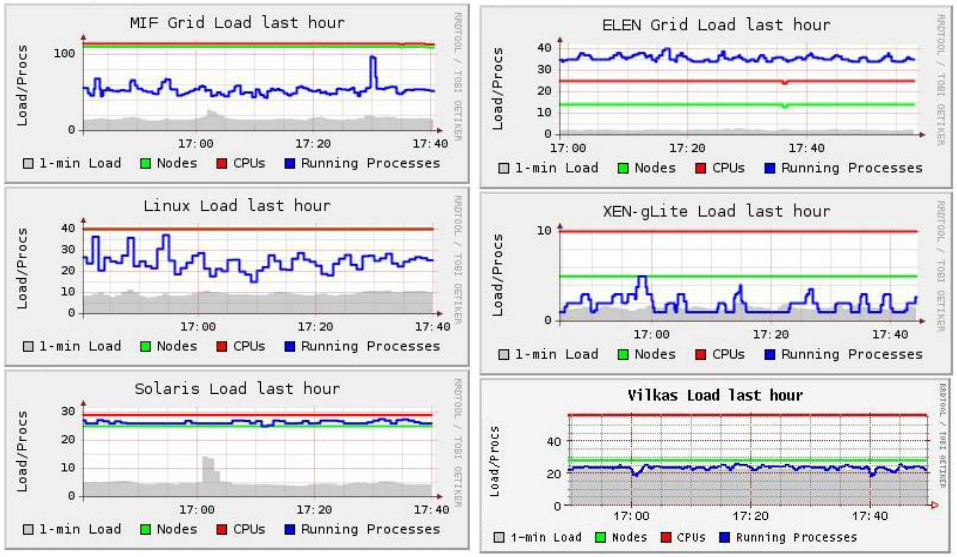
- gLite v.3.0
- LCG v.2.7
- MPI implementation (MPICH)
- VO Litgrid, Gamess, Balticgrid

Software

- ATLAS (Automatically Tuned Linear Algebra Software)
- GAMESS (General Atomic and Molecular Electronic Structure System)
- GNU C/C++, fortran compilers

LitGRID website





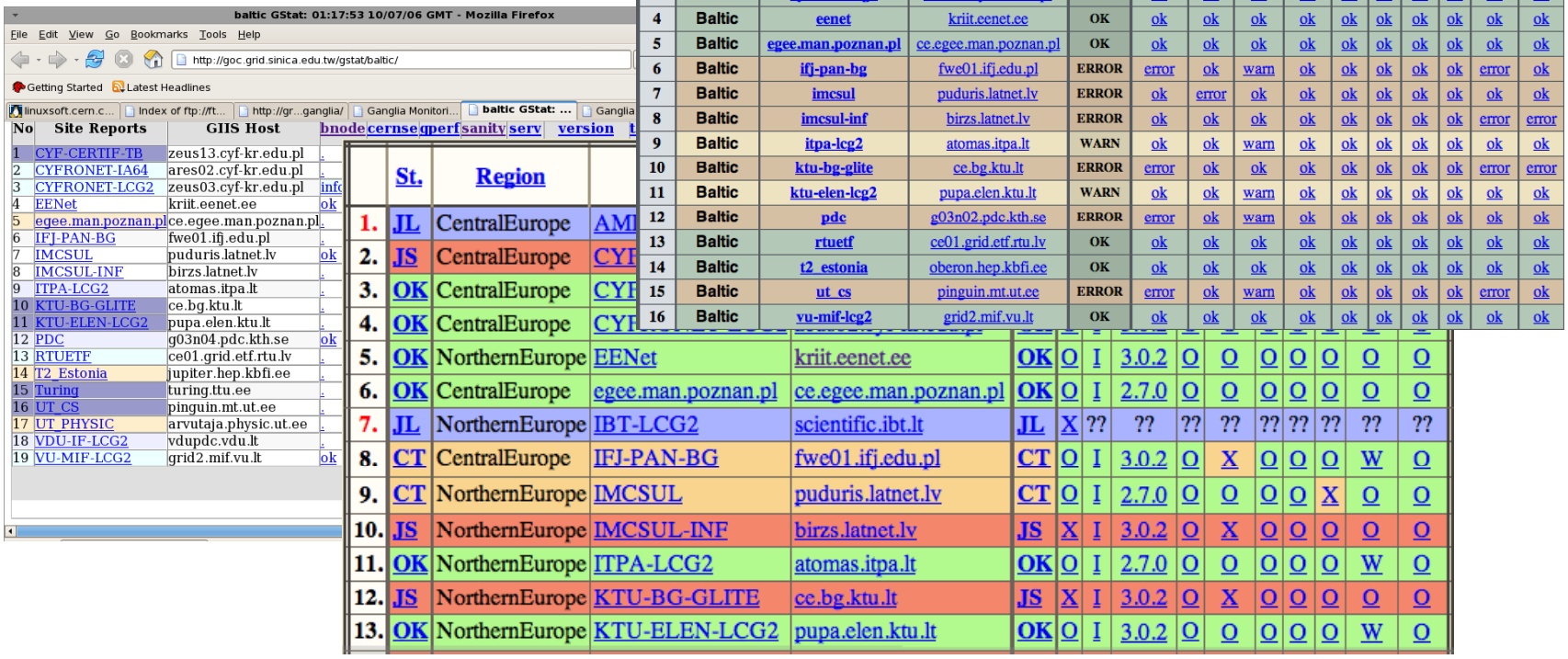
LitGRID website (http://www.litgrid.lt)

- Zope-based website
- Resources monitor (Ganglia based)
- User guides
- Users forum and subscribe mail-list

Monitoring and testing

Monitoring and testing is used from BalticGRID

- GOCdb
- SAM
- SFT, Stress test



baltic GStat: 01:17:53 10/07/06 GMT - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://goc.grid.sinica.edu.tw/gstat/baltic/

Getting Started Latest Headlines

linuxsoft.cern.c... | Index of ftp://ft... | http://gr...ganglia/ | Ganglia Monitori... | baltic GStat: ... | Ganglia

No	Site Reports	GIIS Host	bnode	cernse	gperf	sanity	serv	version
1	CYF-CERTIF-TB	zeus13.cyf-kr.edu.pl	.					
2	CYFRONET-IA64	ares02.cyf-kr.edu.pl	.					
3	CYFRONET-LCG2	zeus03.cyf-kr.edu.pl	inf					
4	EENet	kriit.eenet.ee	ok					
5	egee.man.poznan.pl	ce.egee.man.poznan.pl	.					
6	IFJ-PAN-BG	fwe01.ifj.edu.pl	.					
7	IMCSUL	puduris.latnet.lv	ok					
8	IMCSUL-INF	birzs.latnet.lv	.					
9	ITPA-LCG2	atomas.itpa.lt	.					
10	KTU-BG-GLITE	ce.bg.ktu.lt	.					
11	KTU-ELEN-LCG2	pupa.elen.ktu.lt	.					
12	PDC	g03n04.pdc.kth.se	ok					
13	RTUETF	ce01.grid.etf.rtu.lv	.					
14	T2_Estonia	jupiter.hep.kbfi.ee	.					
15	Turing	turing.ttu.ee	.					
16	UT_CS	pinguin.mt.ut.ee	.					
17	UT_PHYSIC	arvutaja.physic.ut.ee	.					
18	VDU-IF-LCG2	vdupdc.vdu.lt	.					
19	VU-MIF-LCG2	grid2.mif.vu.lt	ok					

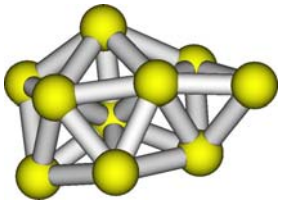
No	RegionName	SiteName	NodeName	Status	balticgrid									
					rgmasc	rm	votag	swdir	csh	ca	ver	bi	rgma	js
1	Baltic	cyf-certif-tb	zeus13.cyf-kr.edu.pl	ERROR	na	na	na	na	na	na	na	na	na	error
2	Baltic	cyfronet-ia64	ares02.cyf-kr.edu.pl	ERROR	ok	ok	ok	error	ok	ok	ok	ok	ok	ok
3	Baltic	cyfronet-lcg2	zeus02.cyf-kr.edu.pl	OK	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
4	Baltic	eenet	kriit.eenet.ee	OK	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
5	Baltic	egee.man.poznan.pl	ce.egee.man.poznan.pl	OK	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
6	Baltic	ifj-pan-bg	fwe01.ifj.edu.pl	ERROR	error	ok	warn	ok	ok	ok	ok	ok	error	ok
7	Baltic	imcsul	puduris.latnet.lv	ERROR	ok	error	ok	ok	ok	ok	ok	ok	ok	ok
8	Baltic	imcsul-inf	birzs.latnet.lv	ERROR	ok	ok	ok	ok	ok	ok	ok	ok	error	error
9	Baltic	itpa-lcg2	atomas.itpa.lt	WARN	ok	ok	warn	ok	ok	ok	ok	ok	ok	ok
10	Baltic	ktu-bg-glite	ce.bg.ktu.lt	ERROR	error	ok	ok	ok	ok	ok	ok	ok	error	error
11	Baltic	ktu-elen-lcg2	pupa.elen.ktu.lt	WARN	ok	ok	warn	ok	ok	ok	ok	ok	ok	ok
12	Baltic	pdc	g03n02.pdc.kth.se	ERROR	error	ok	warn	ok	ok	ok	ok	ok	ok	ok
13	Baltic	rtuetf	ce01.grid.etf.rtu.lv	OK	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
14	Baltic	t2_estonia	oberon.hep.kbfi.ee	OK	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
15	Baltic	ut_cs	pinguin.mt.ut.ee	ERROR	error	ok	warn	ok	ok	ok	ok	ok	error	ok
16	Baltic	vu-mif-lcg2	grid2.mif.vu.lt	OK	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok

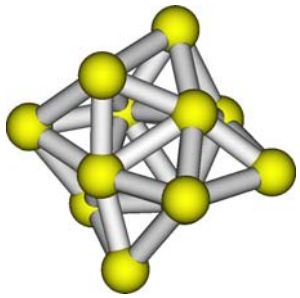
	St.	Region												
1.	JL	CentralEurope	AM											
2.	JS	CentralEurope	CYF											
3.	OK	CentralEurope	CYF											
4.	OK	CentralEurope	CYF											
5.	OK	NorthernEurope	EENet	kriit.eenet.ee	OK	O	I	3.0.2	O	O	O	O	O	O	O
6.	OK	CentralEurope	egee.man.poznan.pl	ce.egee.man.poznan.pl	OK	O	I	2.7.0	O	O	O	O	O	O	O
7.	JL	NorthernEurope	IBT-LCG2	scientific.ibt.lt	JL	X	??	??	??	??	??	??	??	??	??
8.	CT	CentralEurope	IFJ-PAN-BG	fwe01.ifj.edu.pl	CT	O	I	3.0.2	O	X	O	O	O	W	O
9.	CT	NorthernEurope	IMCSUL	puduris.latnet.lv	CT	O	I	2.7.0	O	O	O	O	X	O	O
10.	JS	NorthernEurope	IMCSUL-INF	birzs.latnet.lv	JS	X	I	3.0.2	O	X	O	O	O	O	O
11.	OK	NorthernEurope	ITPA-LCG2	atomas.itpa.lt	OK	O	I	2.7.0	O	O	O	O	O	W	O
12.	JS	NorthernEurope	KTU-BG-GLITE	ce.bg.ktu.lt	JS	X	I	3.0.2	O	X	O	O	O	O	O
13.	OK	NorthernEurope	KTU-ELEN-LCG2	pupa.elen.ktu.lt	OK	O	I	3.0.2	O	O	O	O	O	W	O

Applications

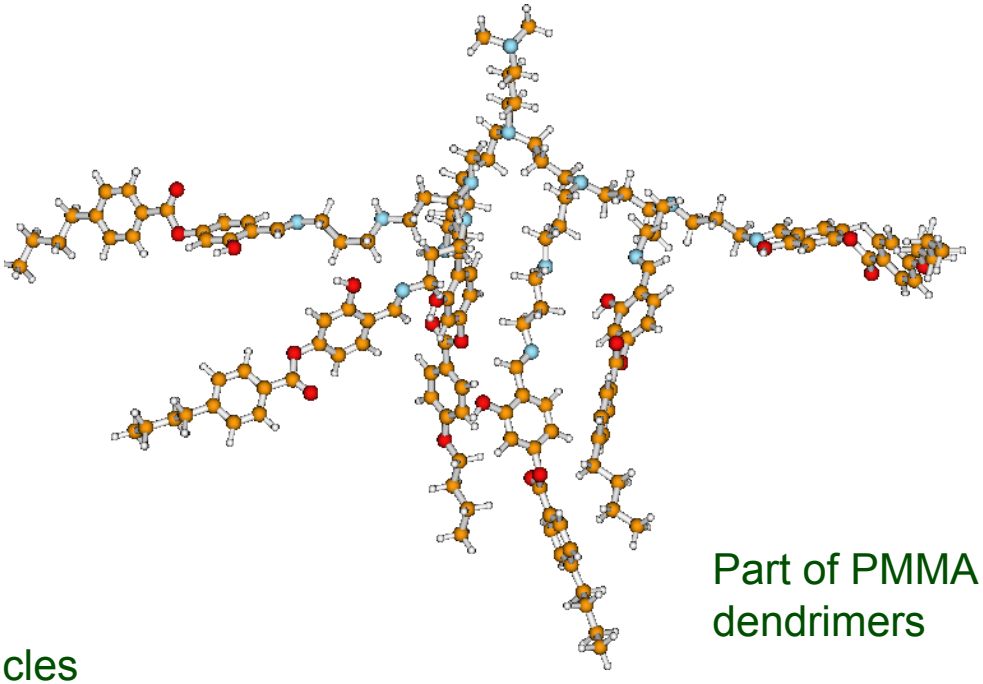
Material science (GAMESS VO)

- Modelling of Processes in Artificial Living Organisms and Elements of Molecular Computers
- Modeling of organic and bioorganic molecules and metal clusters





Geometrical structure of **Co** nanoparticles

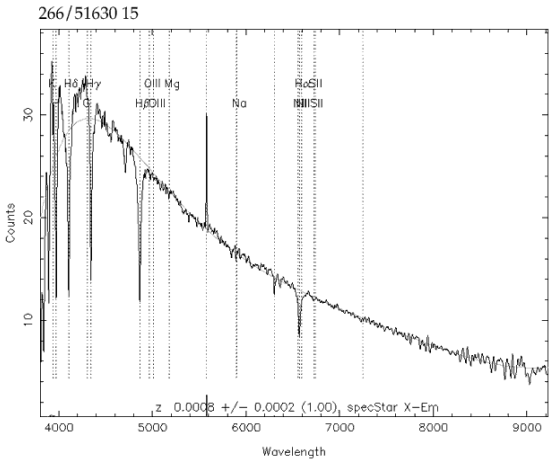


Part of PMMA dendrimers

Candidate applications

Astrophysics

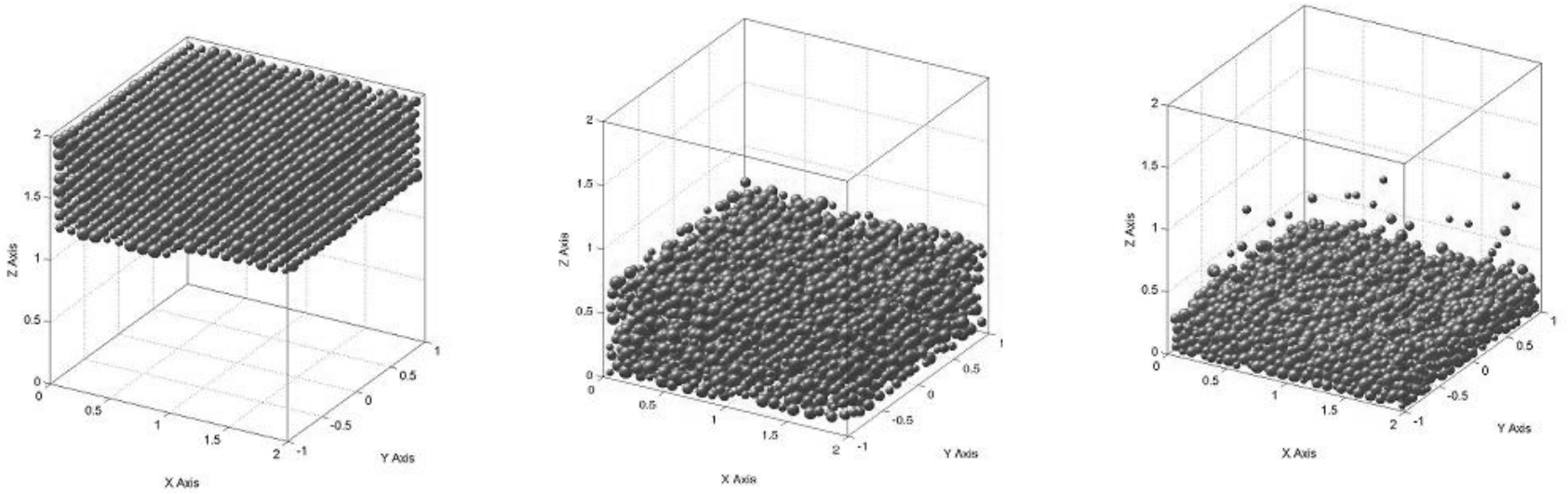
- simulation of the elementary processes in plasmas;
- modeling star formation history in nearby resolved galaxies;
- space observatory Gaia: data modeling and analysis;
- Astrovirtel (Astronomical Archives as Virtual Telescopes): data reduction and analysis.



Candidate applications (cont.)

Numerical modeling and simulation

- CFD (computational fluid dynamics)
- Nonlinear optics and spectroscopy problems
- Bioinformatics, etc.



Simulation granular material flow

Dissimination & training

Dissimination (2005-2006)

- 20+ presentations and talks
- 15 published papers

Training

- 4 workshops for users and clusters administrators
- 3 tutorials (50+ participants)

Summary

- LitGRID project is the beginning of NGI in Lithuania.
- We hope that LitGRID project will be supported by Ministery of Science and Education of Lithuania as national programme.
- LitGRID resources will be tripled during nearest 6 months.
- Atraction of the new users and gridification of the applications is important.