

Pan-European Grid eInfrastructure for LHC Experiments at CERN - SCL's Activities in EGEE

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EGEE



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EGEE – Introduction

- EGEE = Enabling Grids for E-scienceE
- EGEE
 - 1 April 2004 – 31 March 2006
 - 71 partners in 27 countries, federated in regional Grids
- EGEE-II
 - 1 April 2006 – 31 March 2008
 - 91 partners in 32 countries
 - 13 Federations
- Objectives
 - Large-scale, production-quality infrastructure for e-Science
 - Attracting new resources and users from industry as well as science
 - Improving and maintaining “gLite” Grid middleware

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EGEE – Mission

- Infrastructure
 - Manage and operate production Grid for European Research Area
 - Interoperate with e-Infrastructure projects around the globe
 - Contribute to Grid standardisation efforts
- Support applications from diverse communities
 - Astrophysics
 - Computational Chemistry
 - Earth Sciences
 - Finance
 - Fusion
 - Geophysics
 - High Energy Physics
 - Life Sciences
 - Multimedia
 - ...
- Business
 - Forge links with the full spectrum of interested business partners

- + Disseminate knowledge about the Grid through training
- + Prepare for sustainable European Grid Infrastructure

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EGEE – What does it deliver?

- Infrastructure operation
 - Currently includes >200 sites across 39 countries
 - Continuous monitoring of grid services in a distributed global infrastructure
 - Automated site configuration/management

- Middleware
 - Production quality middleware distributed under business friendly open source licence

- User Support
 - Training
 - Documentation
 - Expertise in grid-enabling applications
 - Online helpdesk
 - Networking events (User Forum, Conferences etc.)

- Future
 - Expand on interoperability with related infrastructures

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EGEE eInfrastructure

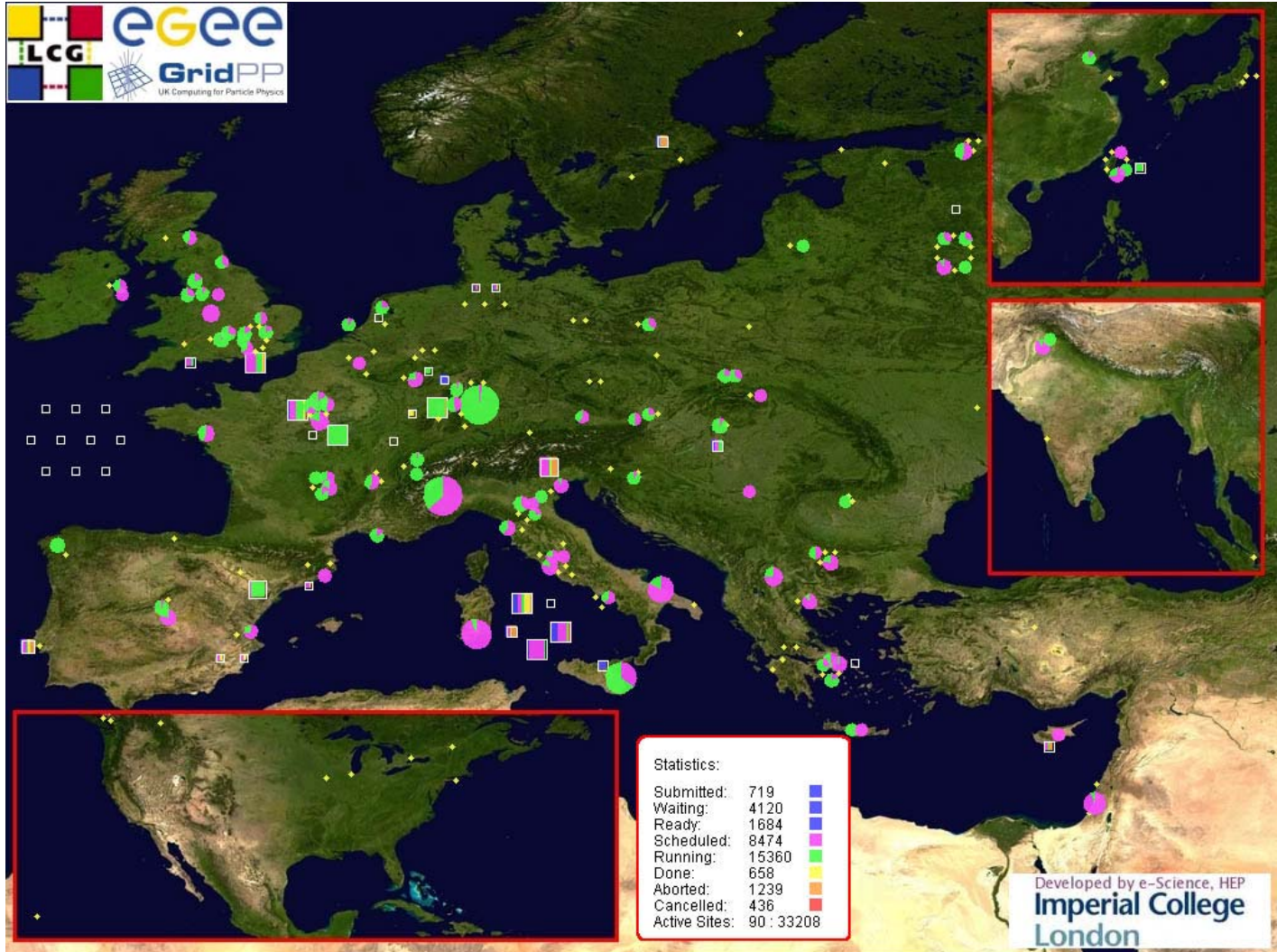
- 243 sites in 50 countries
- 11 federations – ROC's
- 49K CPU's
- 16.7 PB of available storage (12.9 PB used)
- All services provided with multiple redundancy
- More details available on EGEE-II technical sites

eInfrastructure snapshot

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SCL's Resources Committed to EGEE

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AEGIS01-PHY-SCL site hosted at SCL

- The largest (Tier-0) site in AEGIS infrastructure (comprising of 5 additional smaller sites)
- Provides all core services and manages AEGIS VO

Technical details

- Star topology Gigabit Ethernet network, three stacked high-throughput Layer 3 switches (3COM 3870), channel bonding
- 41 computing nodes, 132 CPUs, 130 kSI2K computing power
- 8 core services nodes (providing BDII, RB, WMS, MyProxy, VOMS, LFC, UI)

Current upgrade (financed by CX-CMCS)

- Additional 8 computing nodes (32 CPU cores), 57 kSI2K of computing power, amounting to overall 187 kSI2K and 164 CPUs.
- New storage element, 27 TB of disk space to supported VOs, consists of three disk servers, connected through the Disk Pool Manager interface
- Those jobs are submitted for execution by one of user communities supported by AEGIS01-PHY-SCL (ATLAS, CMS, AEGIS, ESR, SEE, SEEGRID)

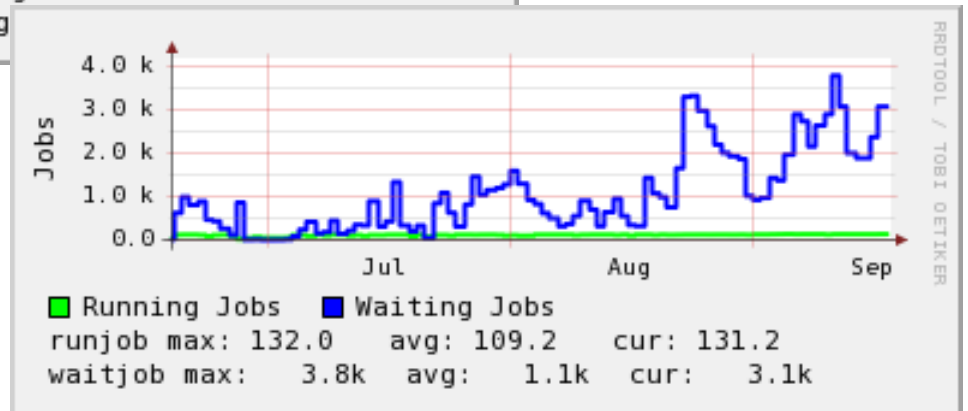
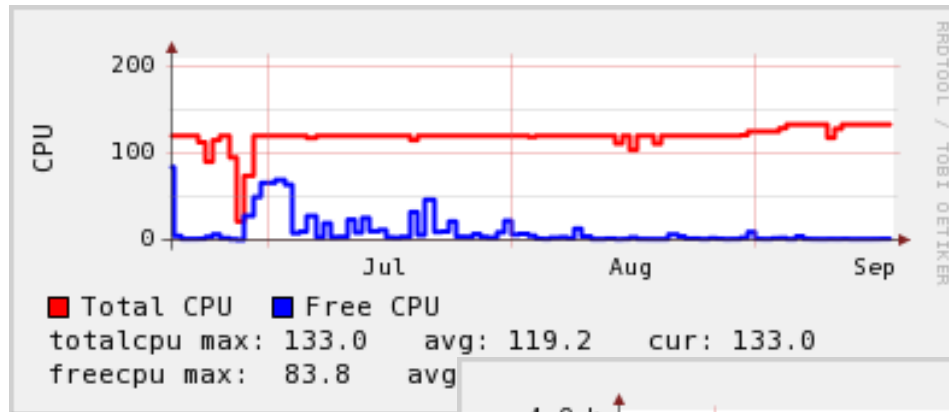
SCL's Resources Committed to EGEE

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- Jobs submitted for execution by one of supported user communities (ATLAS, CMS, AEGIS, ESR, SEE, SEEGRID).



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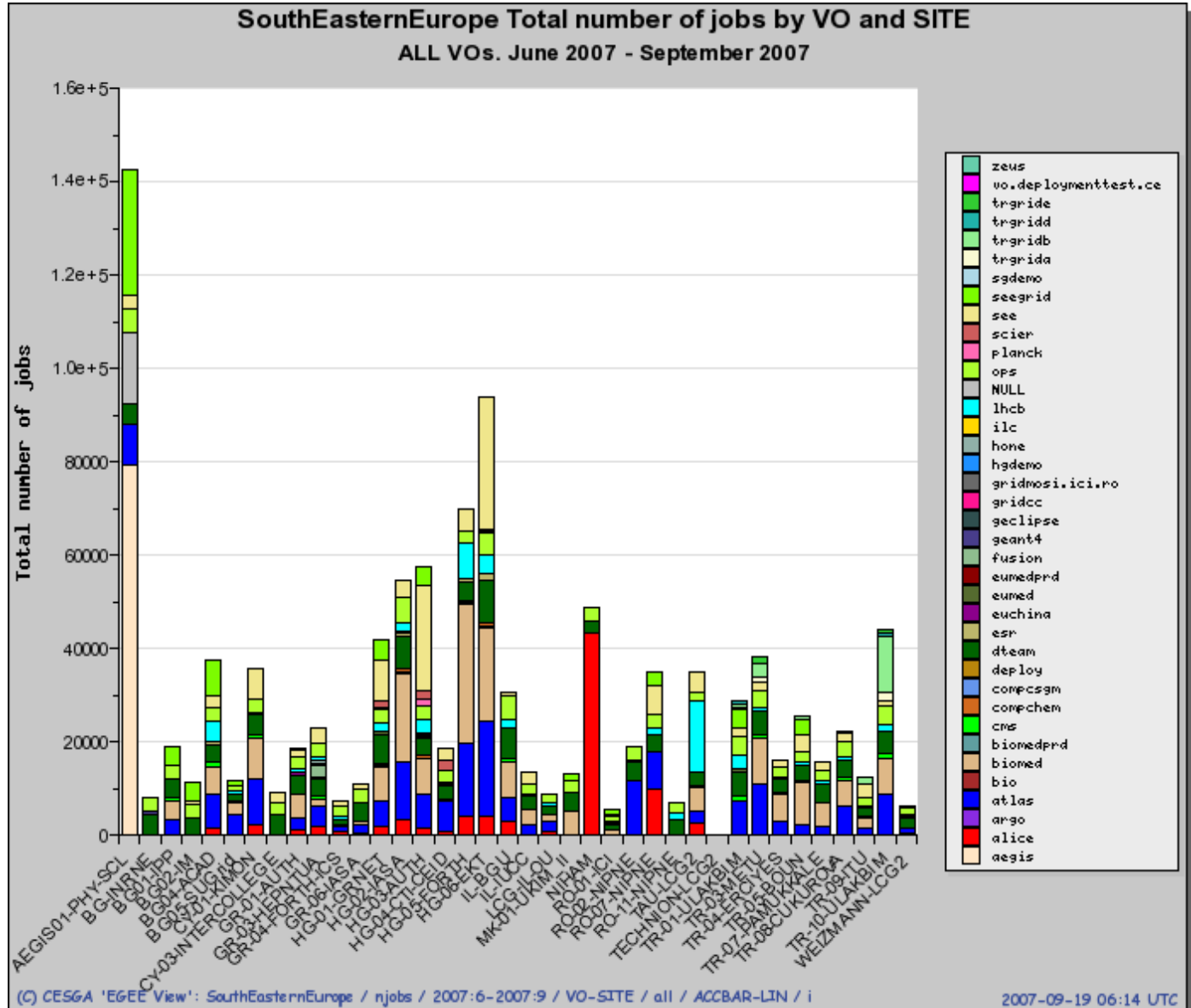
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26. 09. 2007.

Where are we now?



E G E E



A E G I S

Where do we go?

Further improvements of infrastructure

- National Grid infrastructure (within AEGIS)
- Upgrade of AEGIS01-PHY-SCL site
- New sites

Better organisation

- Further strengthening of AEGIS
- Institutional financing (AMRES – like)

Further integration into pan-European eInfrastructure

- EGI = European Grid Initiative
- EGEE-III, SEE-GRID-SCI, ...

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Useful links

- EGEE:
 - <http://www.eu-egee.eu/>
 - <http://egee.phy.bg.ac.yu/>
 - <http://lcg.web.cern.ch/LCG/>
 - <http://glite.web.cern.ch/glite/>
 - <http://egee-technical.web.cern.ch/egee-technical/>
- SEE-GRID-2: <http://www.see-grid.eu/>
- AEGIS: <http://aegis.phy.bg.ac.yu/>
- CX-CMCS: <http://cx-cmcs.phy.bg.ac.yu/>



References

References

(Efficient calculation of path integrals):

- A. Bogojević, A. Balaž, and A. Belić,
 - Phys. Rev. Lett. **94**, 180403 (2005);
 - Phys. Rev. **B72**, 064302 (2005);
 - Phys. Lett. **A344**, 84 (2005);
 - Phys. Lett. **A345**, 258 (2005);
 - Phys. Rev. **E72**, 036128 (2005);
 - Phys. Low Dim. Struct. **1**, 49 (2006);
 - Phys. Low Dim. Struct. **1**, 52 (2006).
- D. Stojiljković, A. Bogojević, and A. Balaž, Phys. Lett. **A360**, 205 (2006).
- J. Grujić, A. Bogojević, and A. Balaž, Phys. Lett. **A360**, 217 (2006).