A brief history of gLite
Past, present and future

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ESAC E-Science Workshop '10

www.eu-egee.org

Information Society and Media

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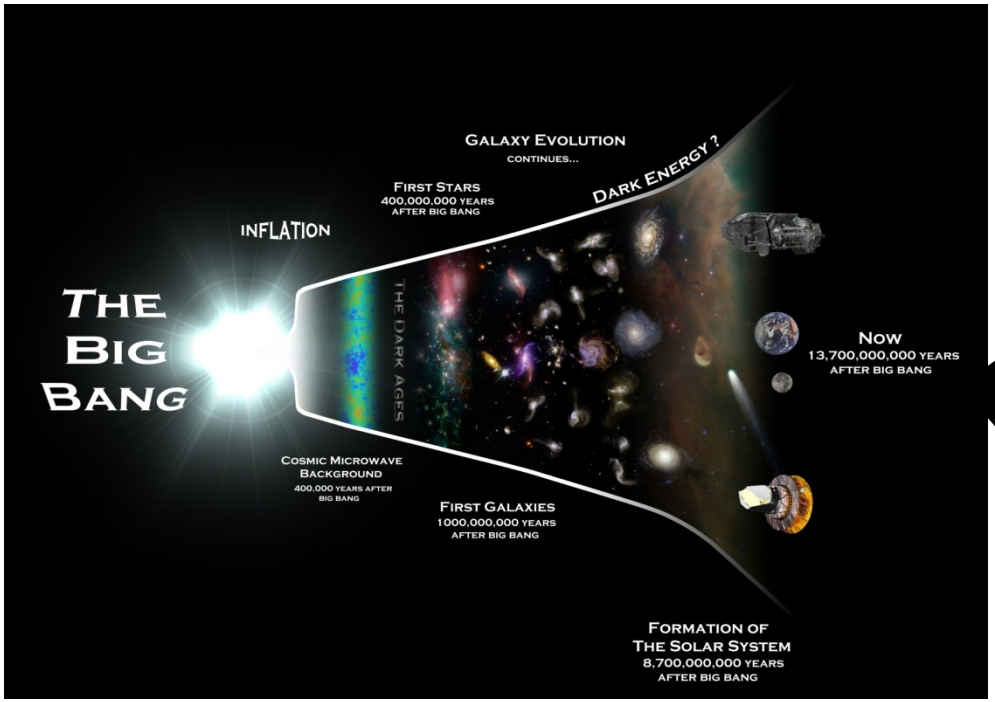
What is gLite?

- Middleware for grid computing
- Developed, integrated, certified and distributed by EGEE
- Developed by more than 80 people in 12 different institutes
- Deployed in more than 250 computer centers in over 30 countries
- Open source
- Scientific Linux

Origins of gLite



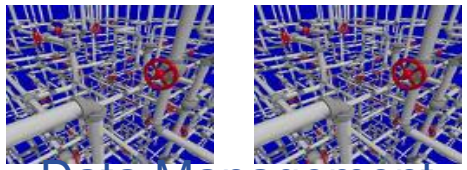
Condor High Throughput Computing

1988 1995 2001 2002 2003 2004

gLite architecture

•(Scientific) Applications

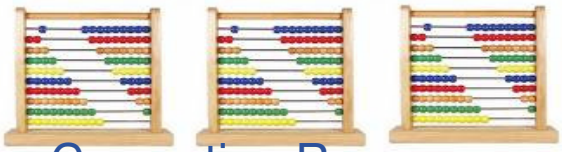
•Job Management



•Data Management

•Index/Catalogs

•Site



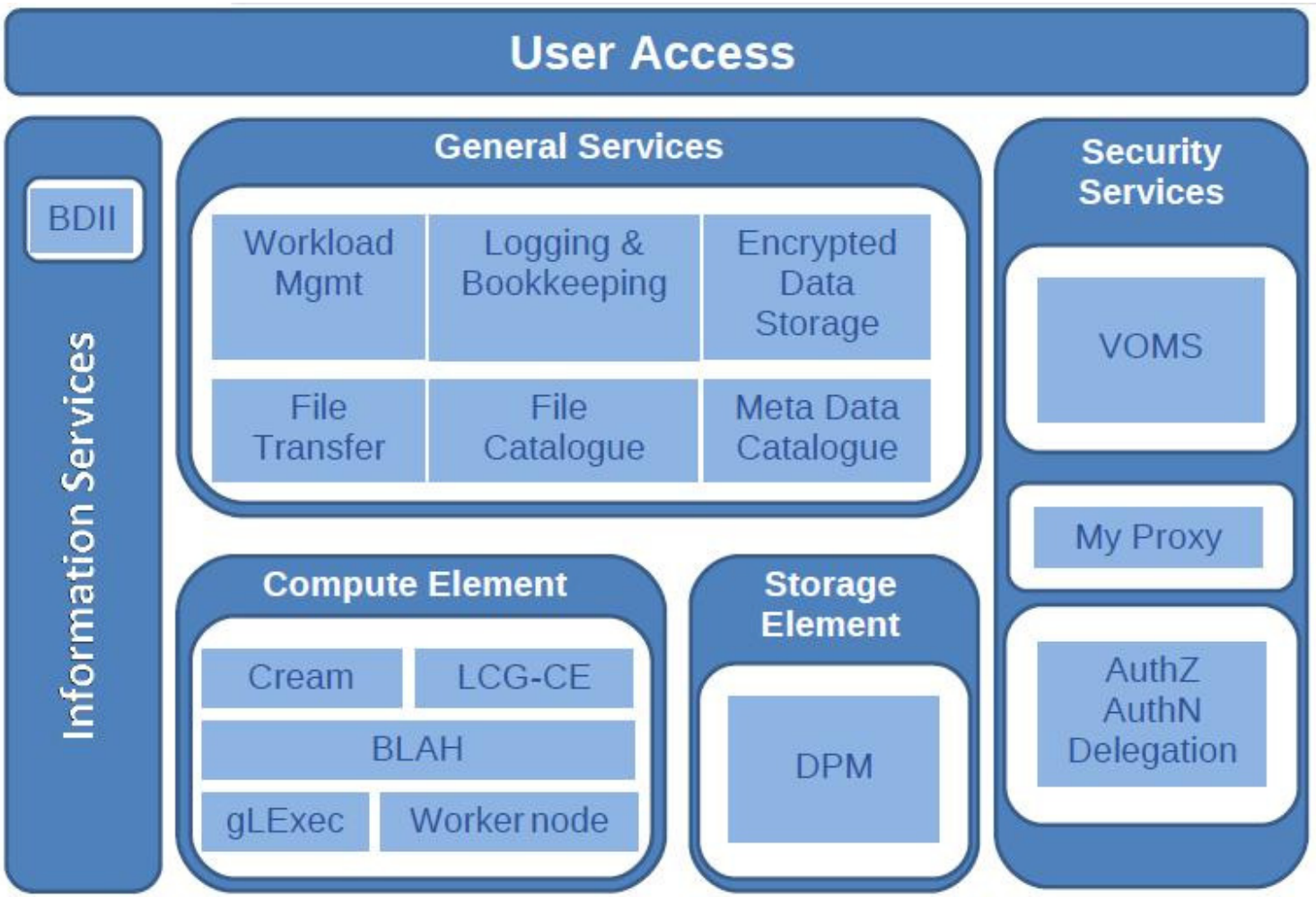
•Computing Resources

•Storage Resources

•Application •High-level MW •Low-level MW

•Security

gLite architecture



gLite architecture

- **General services**
  - Logging and bookeeping: LB
  - File catalogs: LFC, Fireman
  - Data management: GFAL, lcg_utils, gLiteI/O
  - Data transfer: FTS
  - Metadata catalogs: AMGA, Hydra
  - Workload management: WMS
- **Information Services**
  - BDII, MDS, Glue Schema, RGMA
- **Security services (Based on GSI from globus)**
  - Argus, VOMS, SCAS, MyProxy

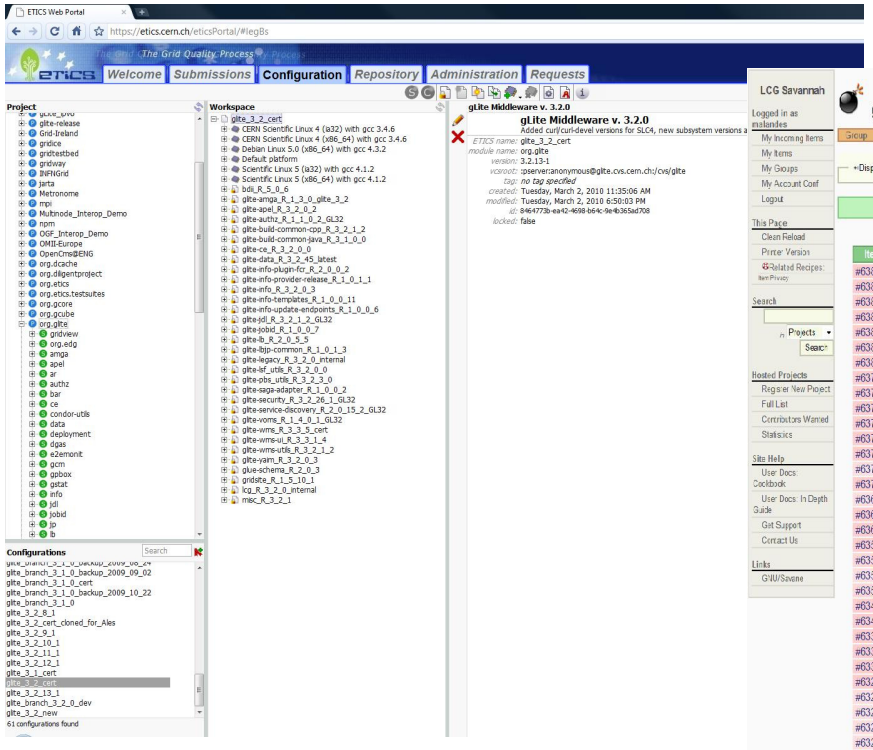
gLite architecture

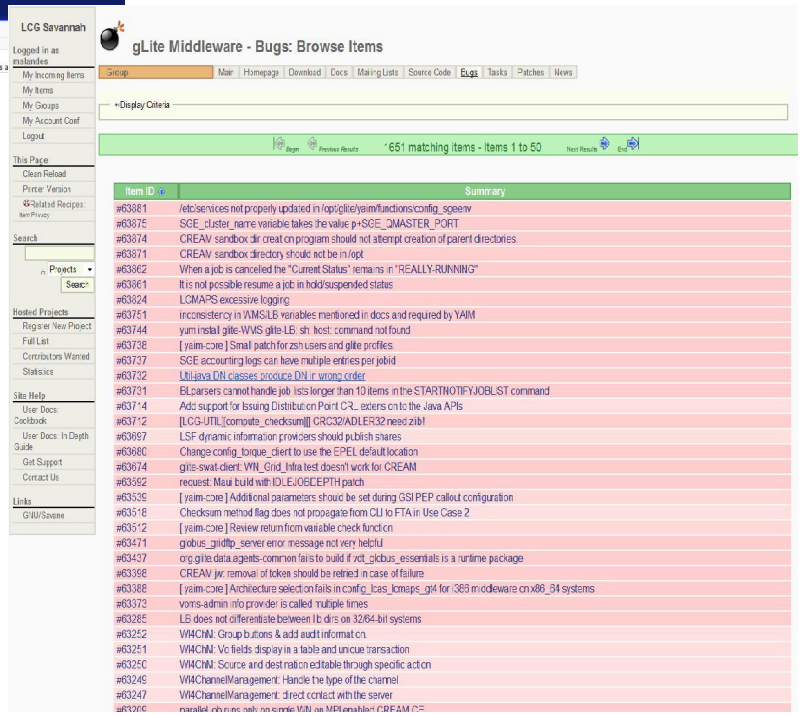
- **Compute Element**
  - WN, CREAM, BLAH, lcg-CE, glite-CE
  - gLexec
- **Storage Element**
  - DPM
- **Accounting**
  - APEL, DGAS
- **User Access**
  - CLI: UI, VOBOX
  - API

gLite tools

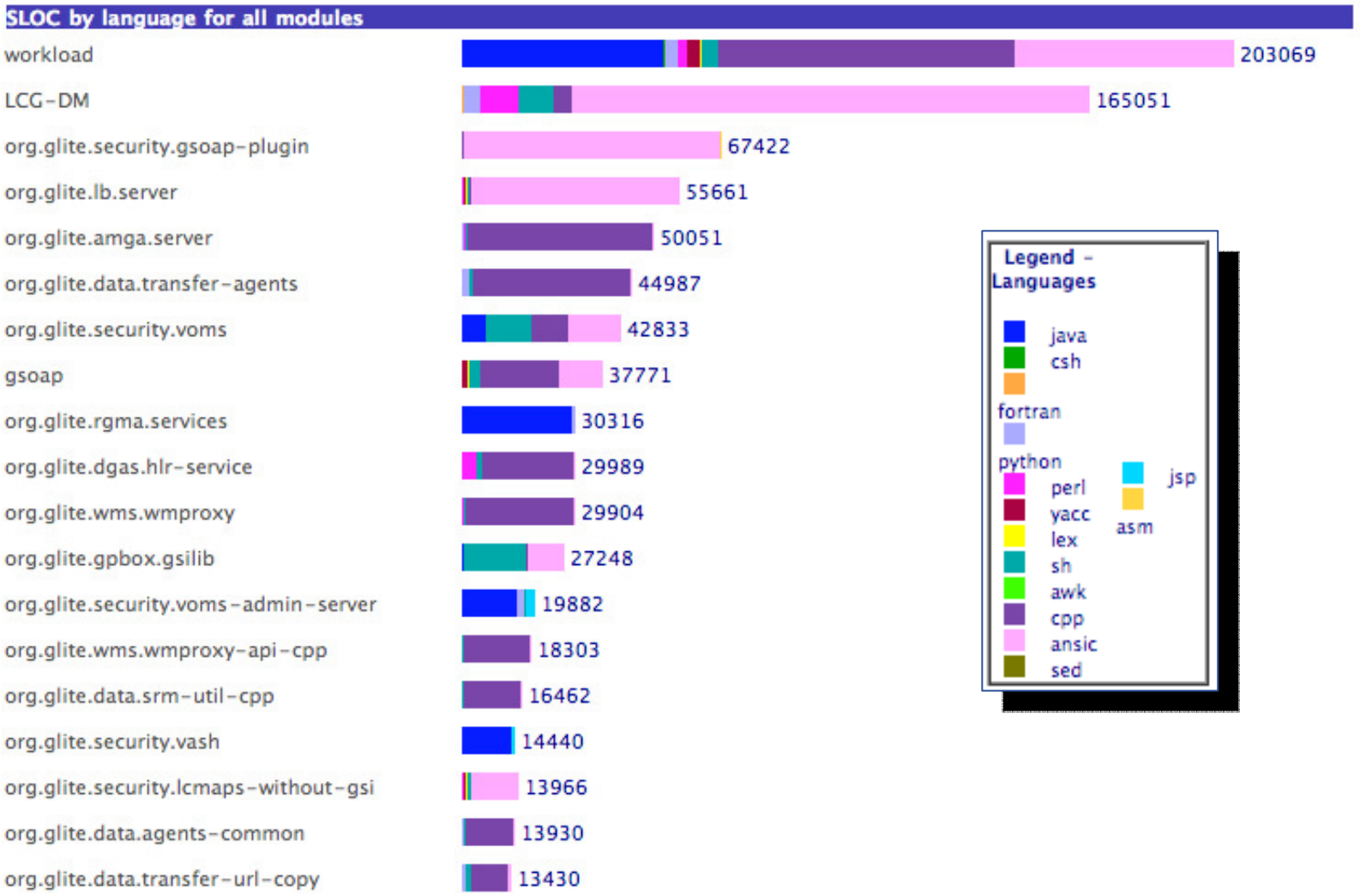
- ETICS is the SW configuration management system
- Savannah is the bug tracking system
- YAIM is the tool we use to configure gLite

YAIM





gLite tools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org.glite.security.lcmaps-without-gsi 13966
org.glite.data.agents-common 13930
org.glite.data.transfer-url-copy 13430
Legend - Languages
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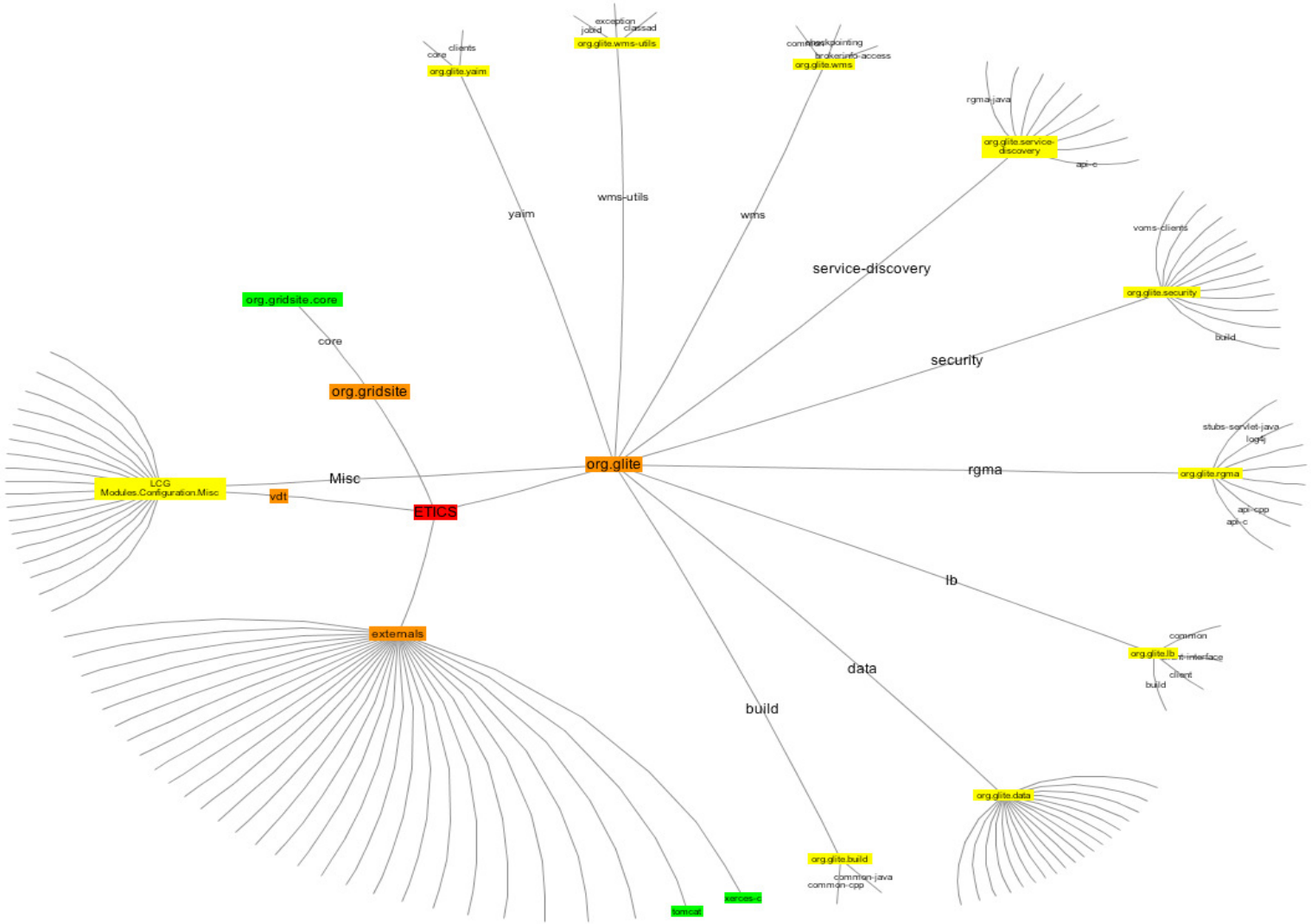
csh
fortran
python
perl
yacc
lex
sh
awk
cpp
ansic
sed
jsp
asm

gLite tools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wms
service-discovery
security
rgma
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Misc
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core
ETICS
vdt
LCG Modules.Configuration.Misc
externals
org.glite.yaim
org.glite.wms-utils
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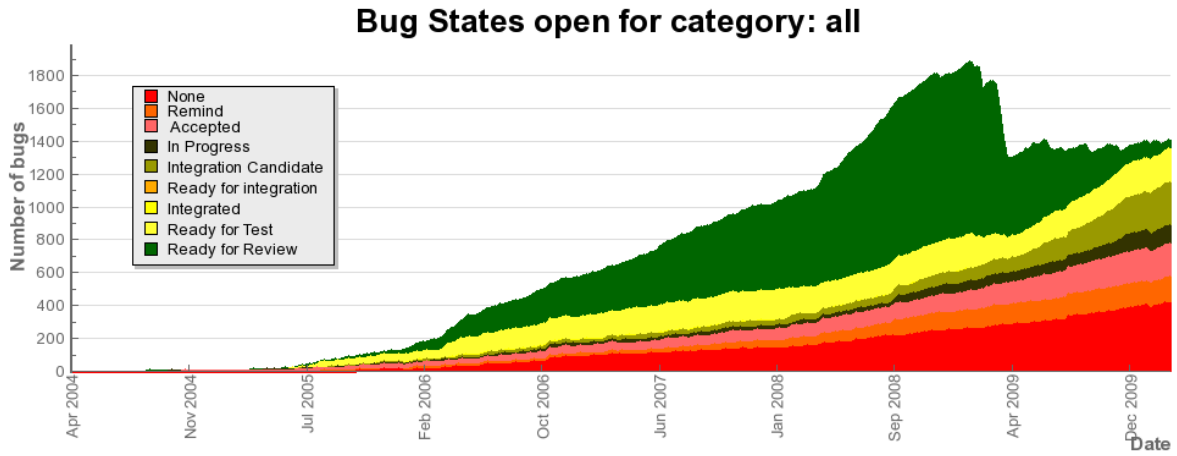
org.glite.build
tomcat
xerces-c

gLite tools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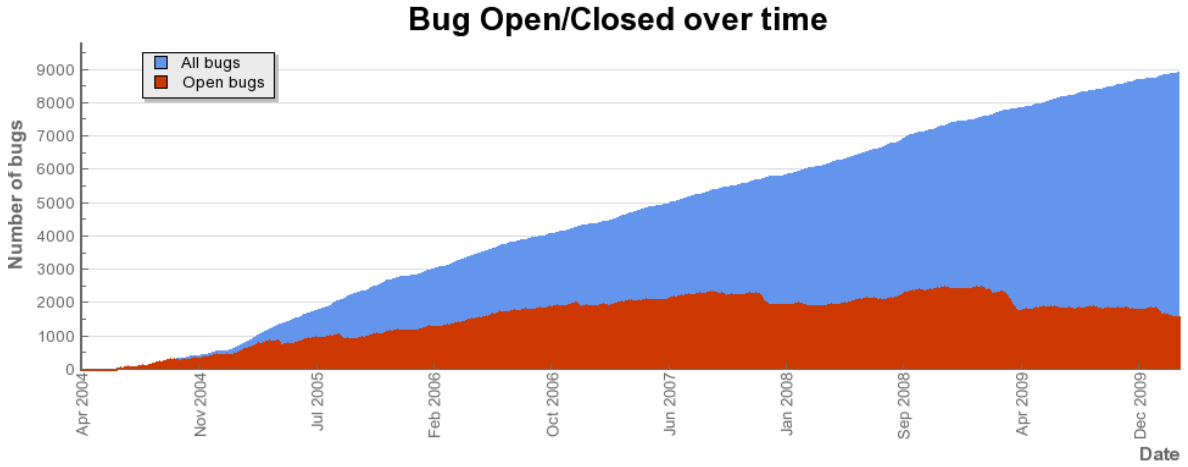
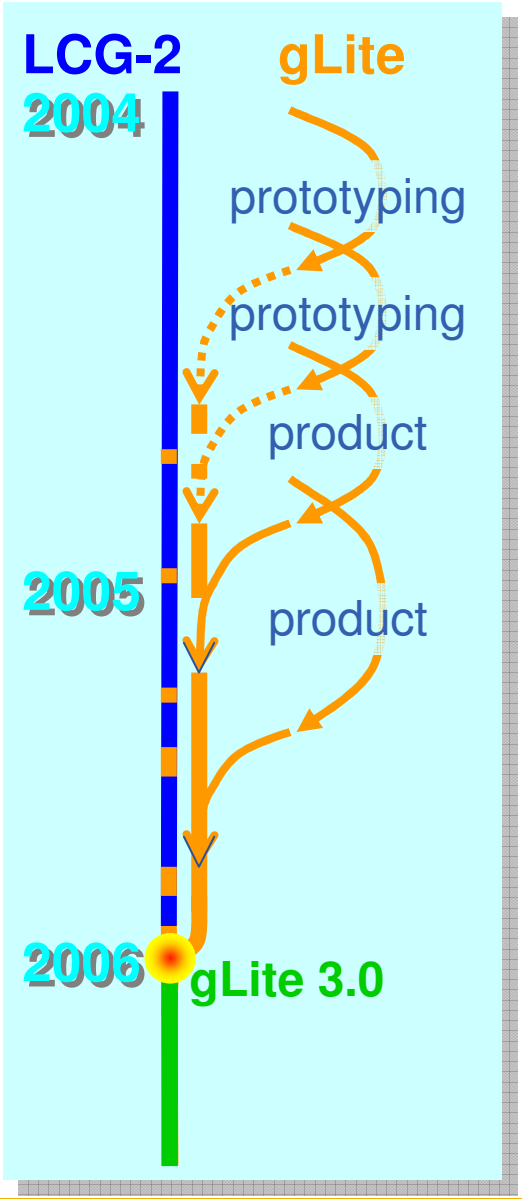
Number of bugs
Date
None
Remind
Accepted
In Progress
Integration Candidate
Ready for integration
Integrated
Ready for Test
Ready for Review
0
200
400
600
800
1000
1200
1400
1600
1800
Apr 2004
Nov 2004
Jul 2005
Feb 2006
Oct 2006
Jun 2007
Jan 2008
Sep 2008
Apr 2009
Dec 2009

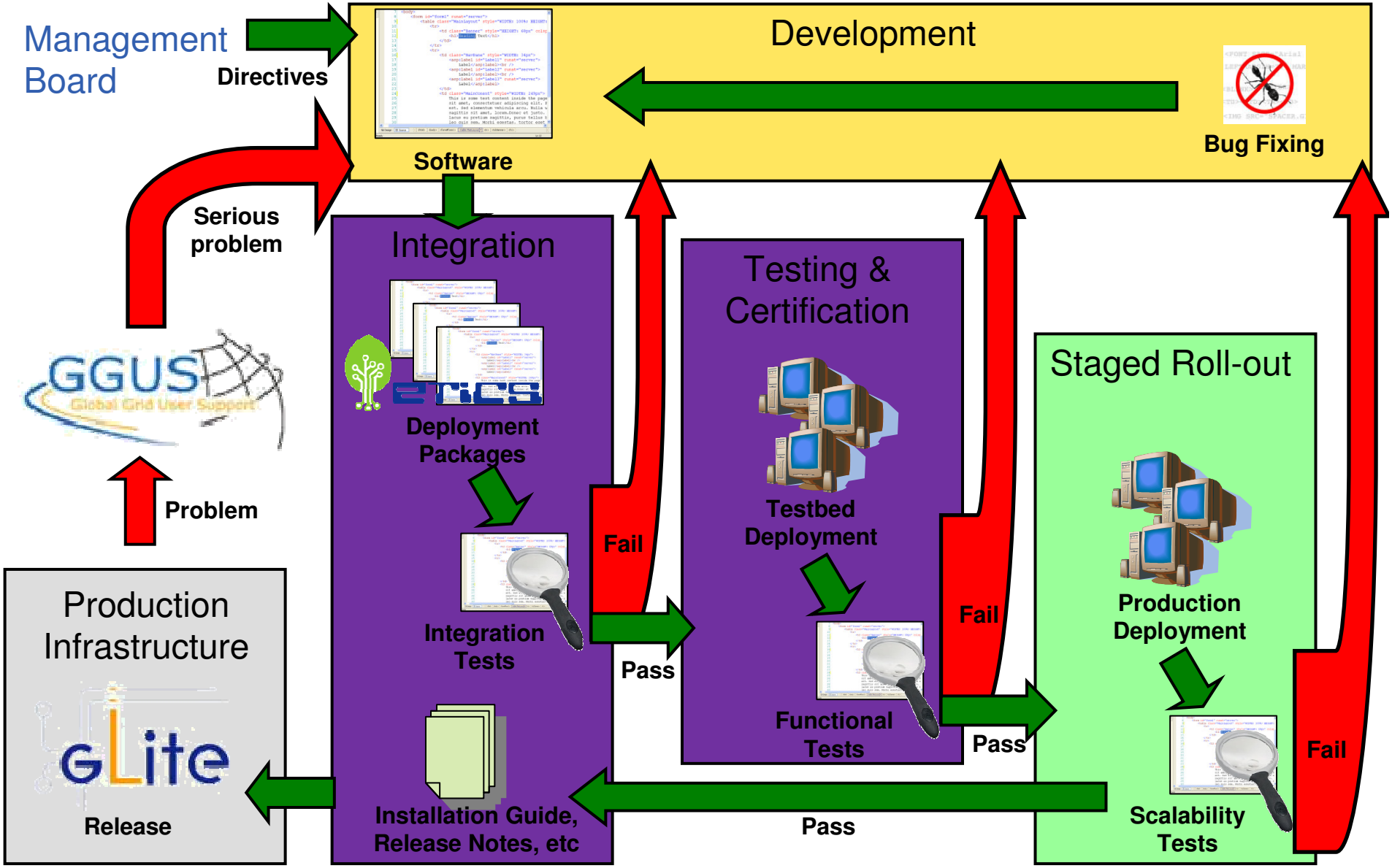

Bug Open/Closed over time
Number of bugs
Date
All bugs
Open bugs
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Apr 2004
Nov 2004
Jul 2005
Feb 2006
Oct 2006
Jun 2007
Jan 2008
Sep 2008
Apr 2009
Dec 2009

gLite releases

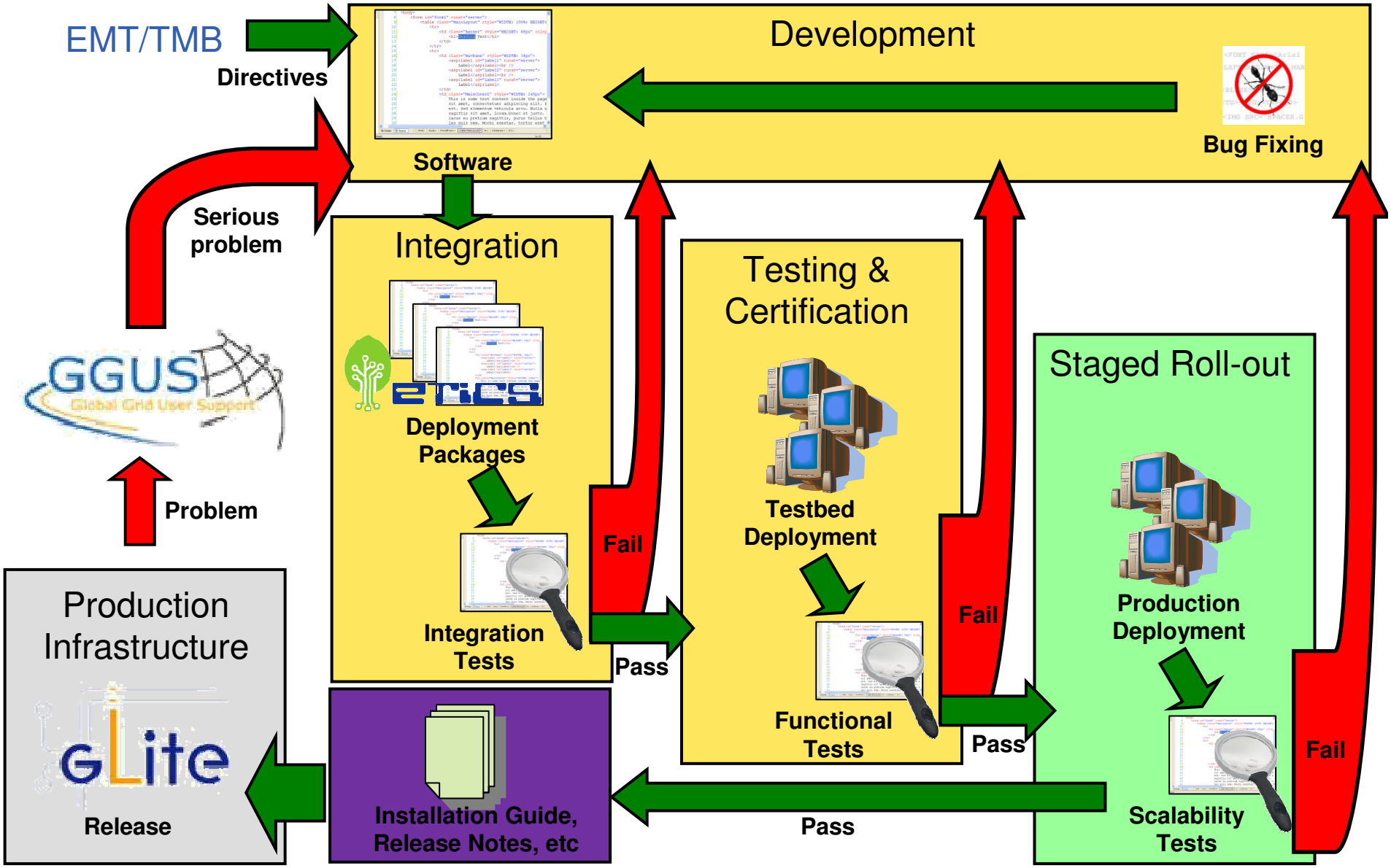
- **gLite 1.0 - April 2005**
  - prototyping phases
  - Scientific Linux 3
- **gLite 3.0 - May 2006**
  - convergence with LCG-2
  - Scientific Linux 3
  - legacy ANT-based and LCG build systems
  - APT installation tool
- **gLite 3.1 - June 2007**
  - Scientific Linux 4
  - ETICS build system
  - YUM installation tool
- **gLite 3.2 - March 2009**
  - Scientific Linux 5



gLite development Process

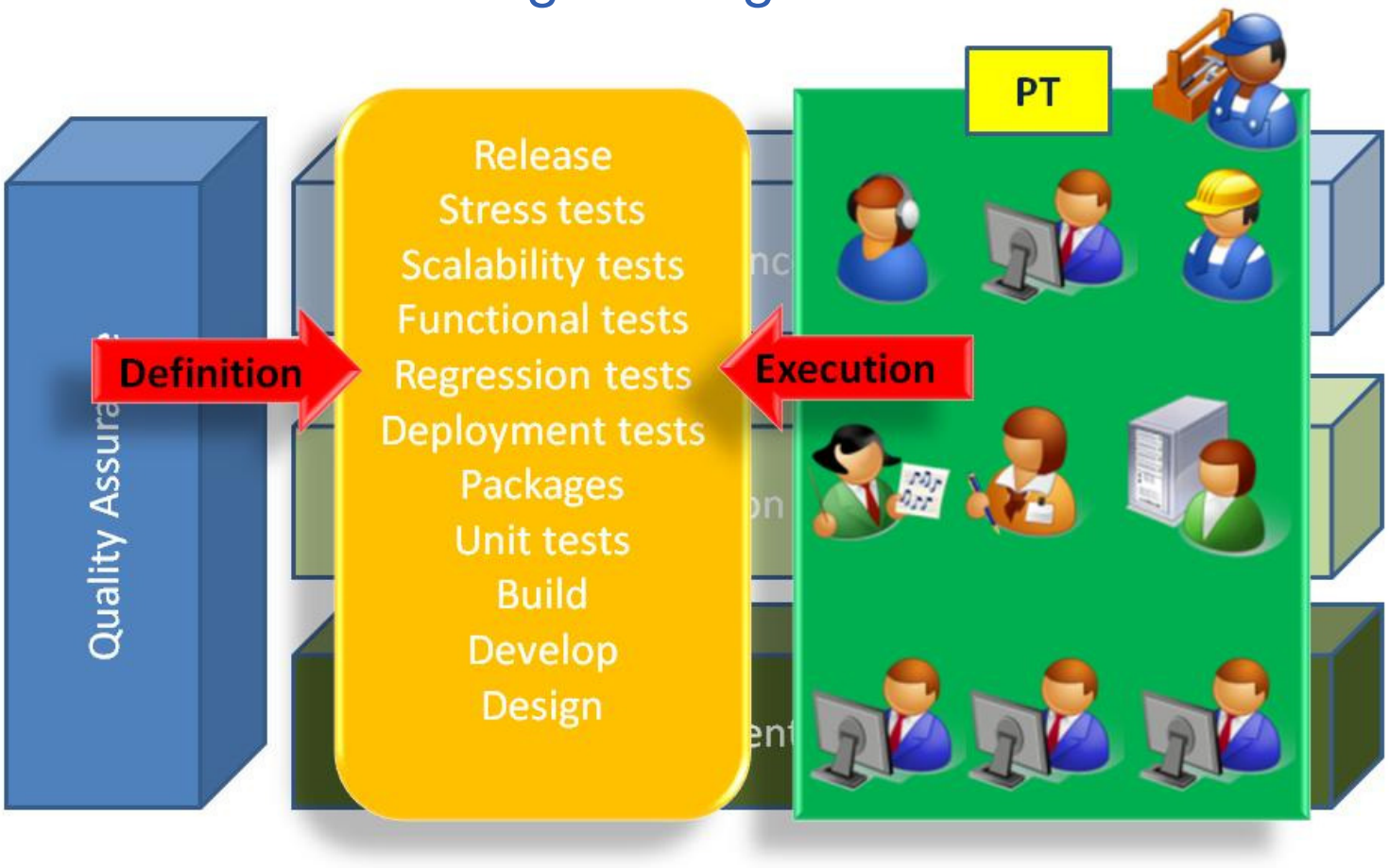


gLite development Process



gLite development process

Software Engineering in EMI

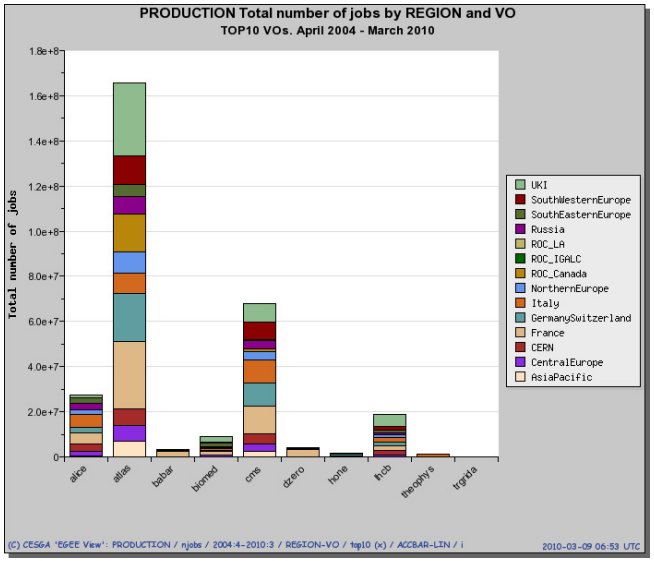


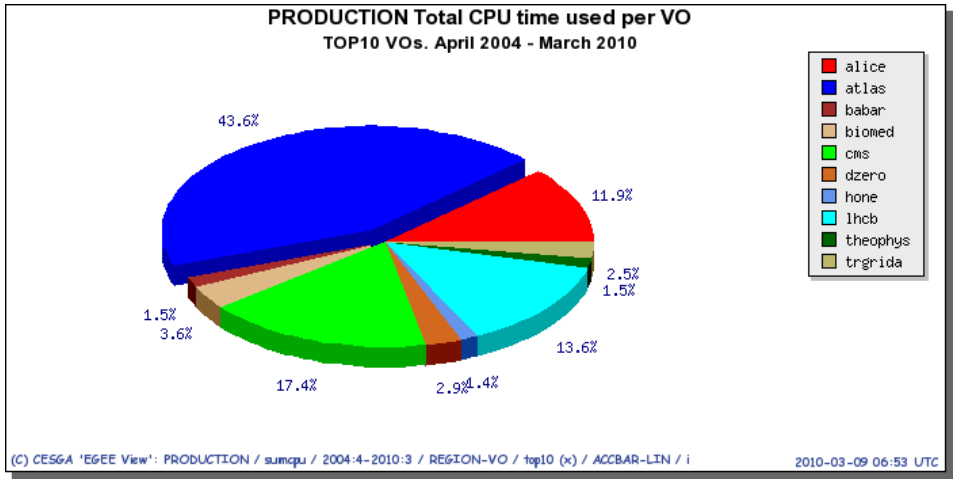
gLite deployment on EGEE

- gLite releases announcements are broadcasted to all EGEE sites through the Operations Portal
- User support is done through the Global Grid User Support (GGUS)

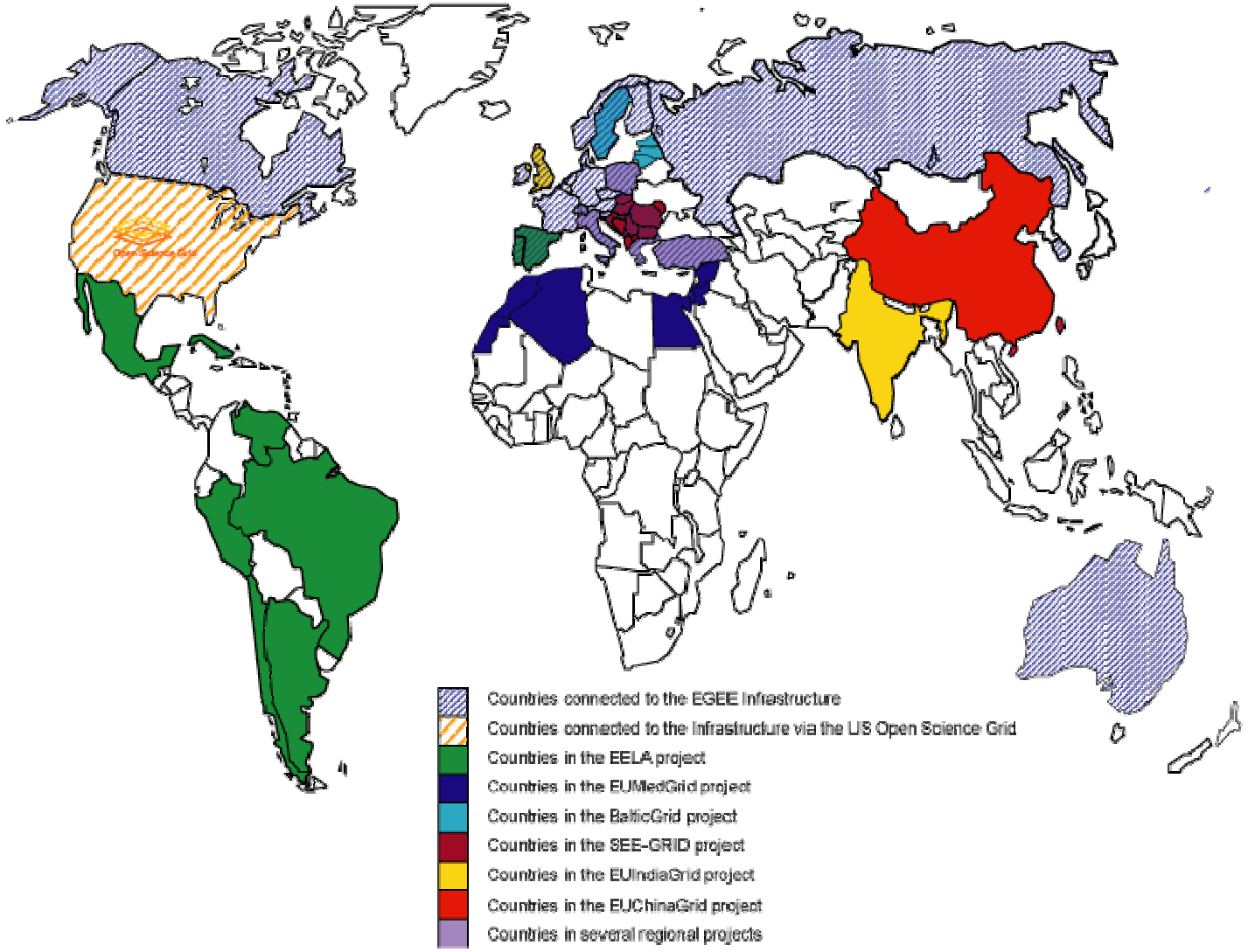
gLite deployment on EGEE

- **316 sites**
  - 132 sites: gLite 3.2
  - 164 sites: gLite 3.1
- **~140K CPU cores**
- **~25 PB disk, ~38PB tape**
- **~400 Kjobs/day**





gLite deployment in EGEE



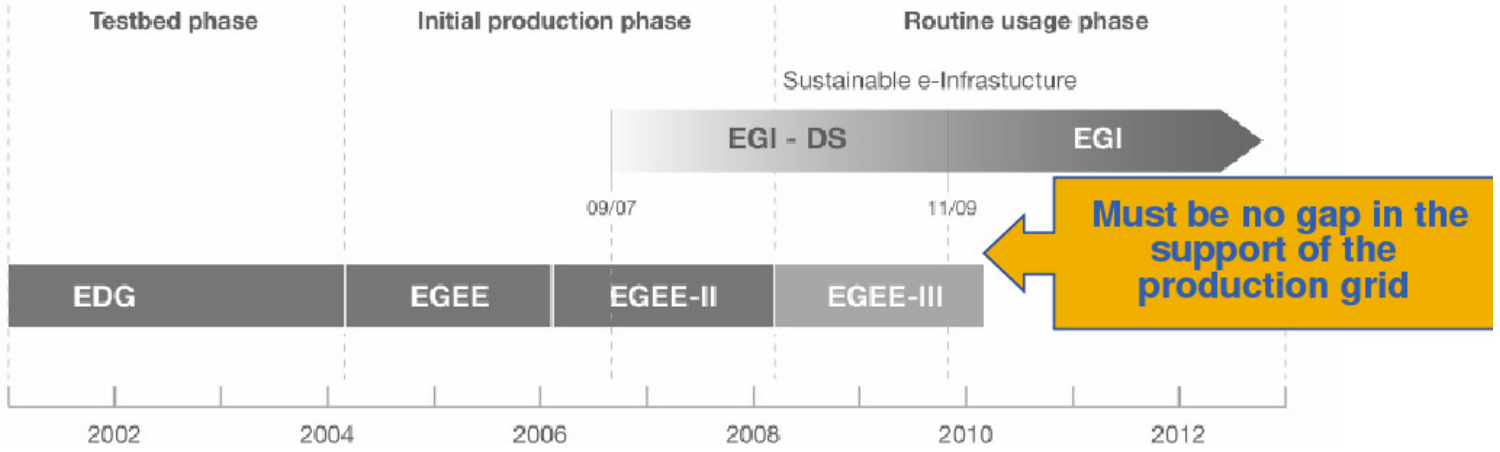
User Communities

- **Most of gLite services (FTS, CREAM, WMS, VOBOX)**
  - High Energy Physics
- **Workload Management system (WMS, LB and lcg-CE)**
  - Life Sciences: also AMGA, DPM, Hydra and LFC
  - Astronomy and Astrophysics: also using gateways like Ganga and Diane
- **Other user communities**
  - Civil Protection
  - Computational Chemistry
  - Earth Sciences
  - Finance
  - Fusion: also using gateways like Ganga and Diane
  - Geophysics
  - Multimedia
  - Material Sciences
  - Archeology

Domain	s	Users
AA	20	373
CC	4	347
CS	4	21
ES	7	142
F	2	68
HEP	36	8577
LS	9	379
MV	26	1658
OTH	28	1816
TOTAL	136	13381

The future of gLite

- **The future is EMI**
  - Address the needs of scientific communities in EGI together with ARC, UNICORE and others
- **Standardization**
- **Interoperability**
- **Sustainability**



Summary

- **After six years of gLite…**
  - It provides a distribution of middleware components that allows to build a Grid to enable global science
  - It focus on production quality, interoperability/standardization and security
  - It makes the EGEE infrastructure a reality
- **EGI and EMI are the first step towards a really sustainable model for a Grid infrastructure in Europe (and outside)**

Some links

- gLite home page: http://glite.web.cern.ch/glite/
- EGEE project home page: http://www.eu-egee.org/
- EGI project home page: http://web.eu-egi.eu/
- EMI presentation in the EGEE 09 conference:
  - http://indico.cern.ch/getFile.py/access?contribId=382&sessionId=4&resId=1&materialId=slides&confId=55893
- UMD: http://knowledge.eu-egi.eu/knowledge/index.php/UMD