SA1: Grid Operations and Management

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SA1 Activity Manager

EGEE 2nd EU Review

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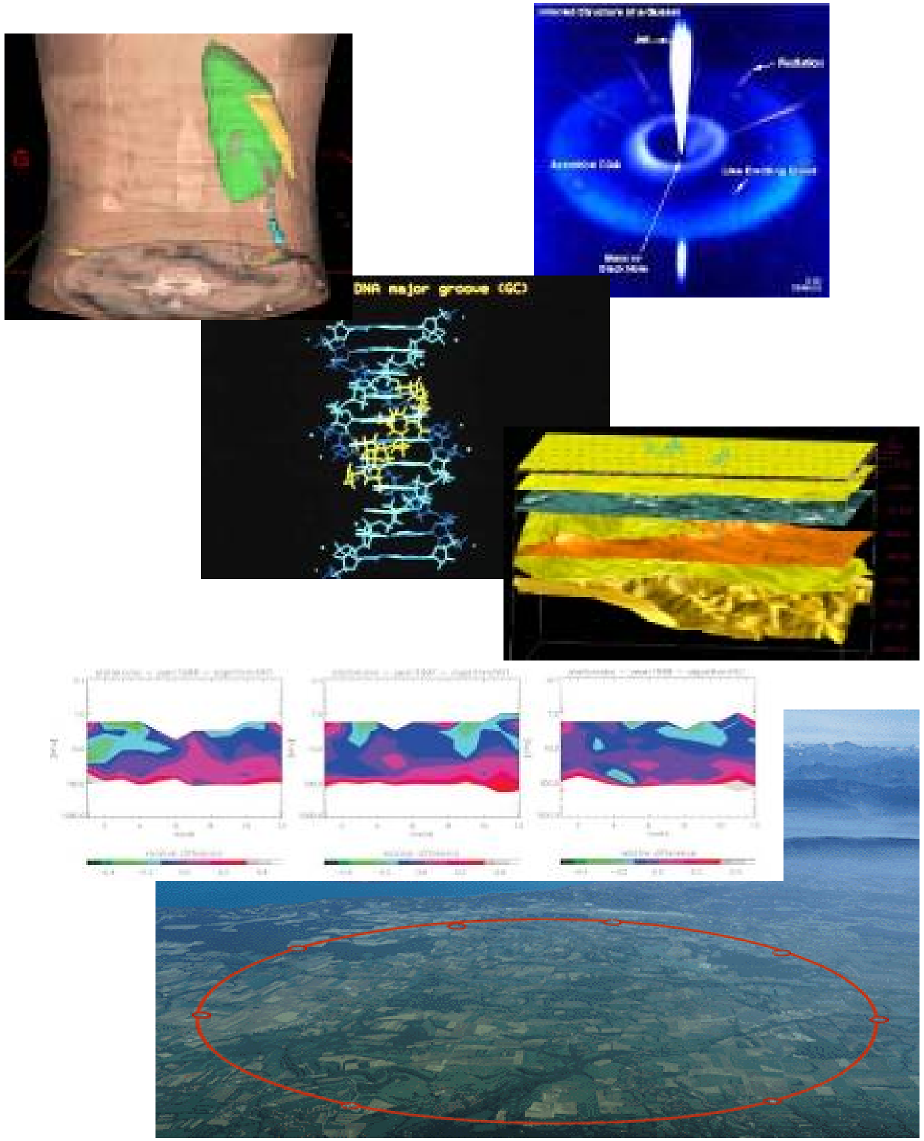
www.eu-egee.org

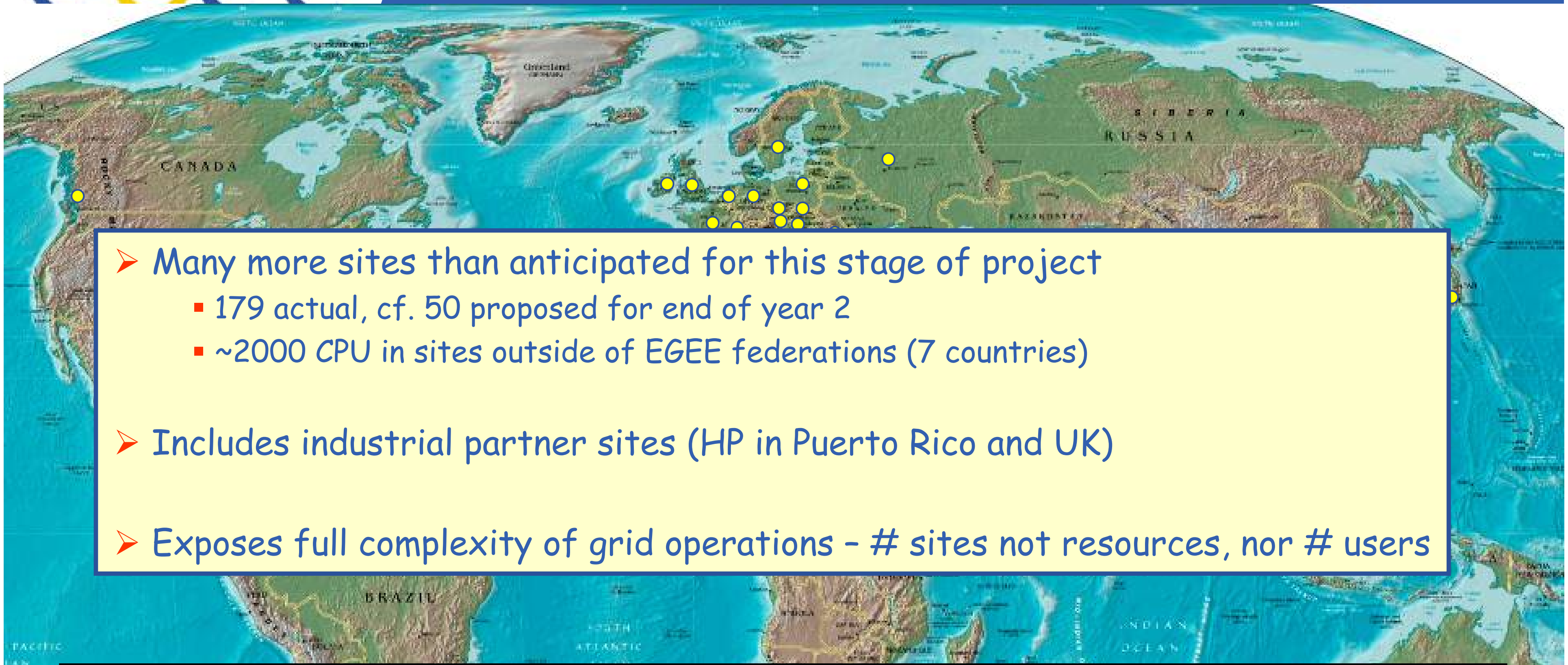
Information Society and Media

Outline

- Scale and usage of infrastructure
- Grid Operations
  - Metrics, operations support
- Certification and deployment
- Pre-production Service
- User support
- Operational security
- Interoperability / interoperation
- Input to standards process
- LCG-2/gLite convergence
- Key points for SA1
- Plans for remainder of project



EGEE Grid Sites : November 2005



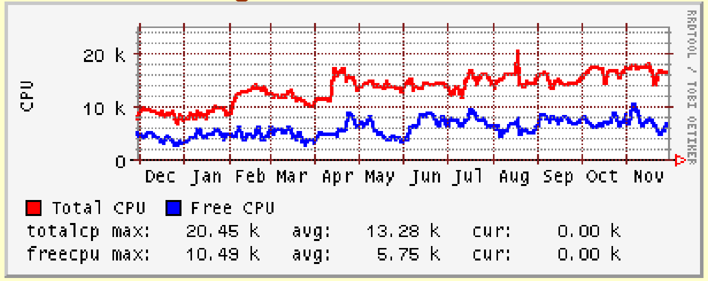
- ➢ Many more sites than anticipated for this stage of project
  - ▪ 179 actual, cf. 50 proposed for end of year 2
  - ▪ ~2000 CPU in sites outside of EGEE federations (7 countries)
- ➢ Includes industrial partner sites (HP in Puerto Rico and UK)
- ➢ Exposes full complexity of grid operations – # sites not resources, nor # users

EGEE:

179 sites, 39 countries

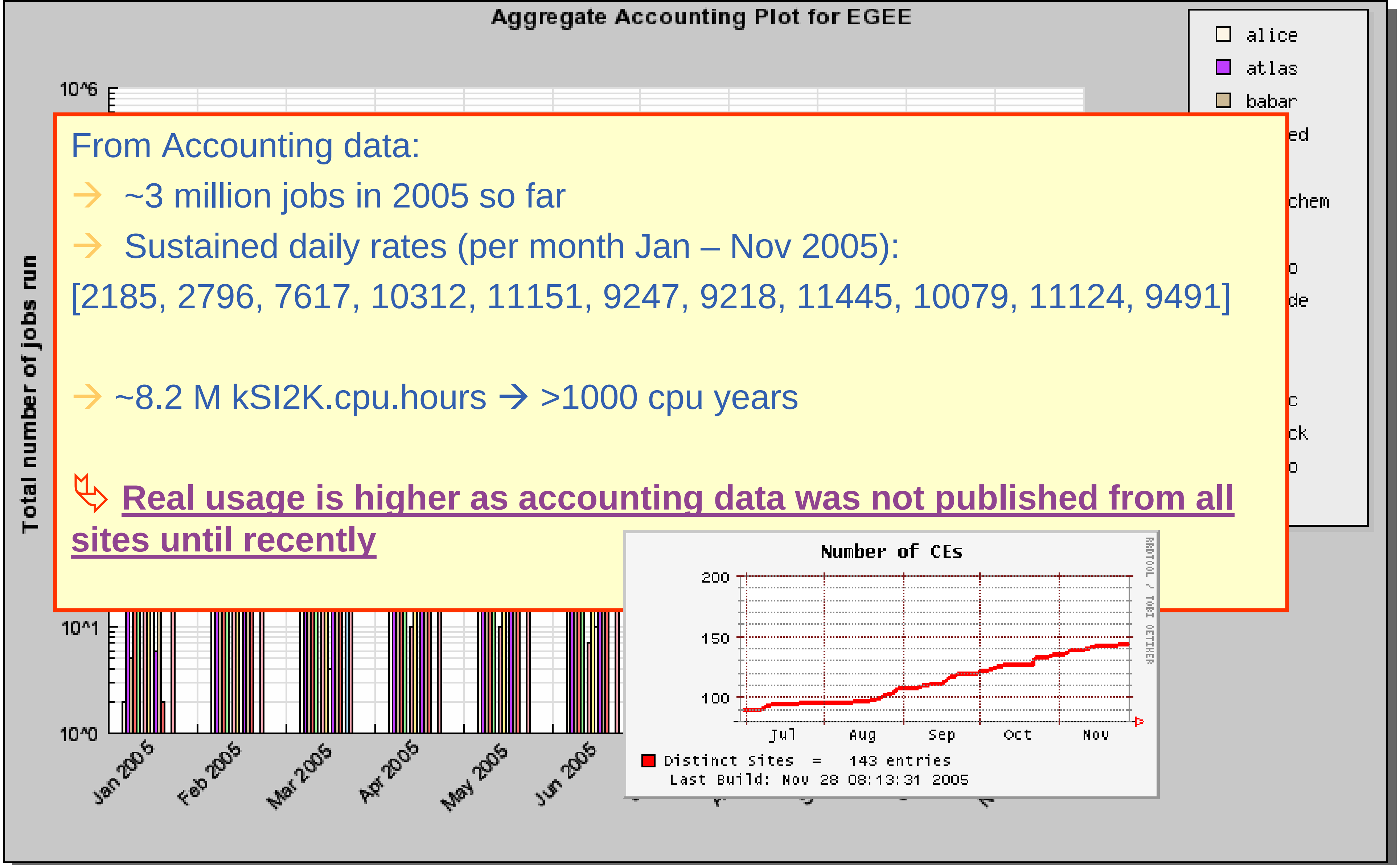
>17,000 processors,

~5 PB storage



country	sites	country	sites	country	sites
Austria	2	India	2	Russia	12
Belgium	3	Ireland	15	Serbia	1
Bulgaria	4	Israel	3	Singapore	1
Canada	7	Italy	25	Slovakia	4
China	3	Japan	1	Slovenia	1
Croatia	1	Korea	1	Spain	13
Cyprus	1	Netherlands	3	Sweden	4
Czech Republic	2	Macedonia	1	Switzerland	1
Denmark	1	Pakistan	2	Taipei	4
France	8	Poland	5	Turkey	1
Germany	10	Portugal	1	UK	22
Greece	6	Puerto Rico	1	USA	4
Hungary	1	Romania	1	CERN	1

10,000 jobs /day



From Accounting data:

→ ~3 million jobs in 2005 so far

→ Sustained daily rates (per month Jan – Nov 2005):

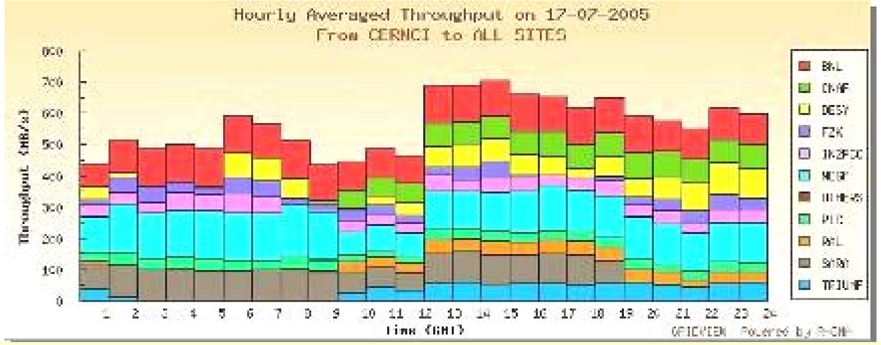
[2185, 2796, 7617, 10312, 11151, 9247, 9218, 11445, 10079, 11124, 9491]

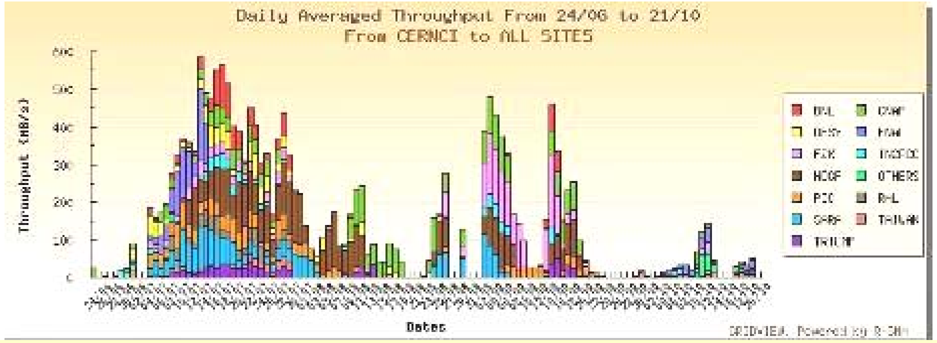
→ ~8.2 M kSI2K.cpu.hours → >1000 cpu years

Real usage is higher as accounting data was not published from all sites until recently

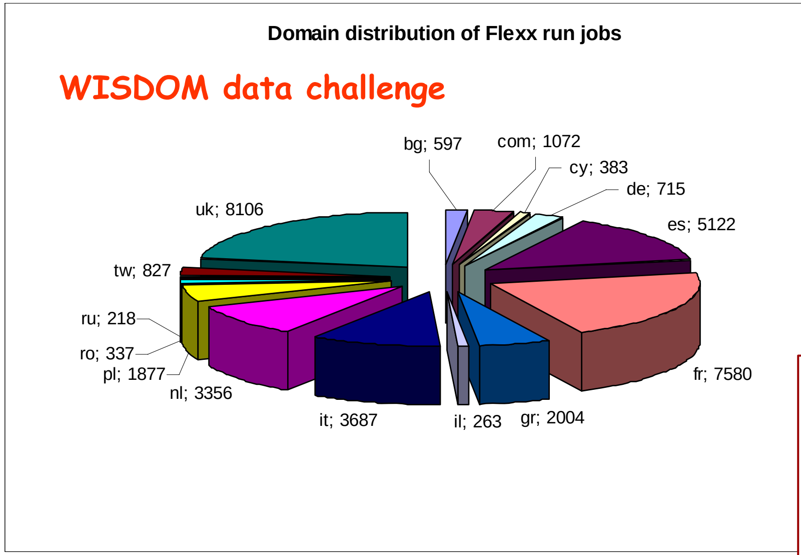
Enabling Grids for E-sciencE

Some example uses

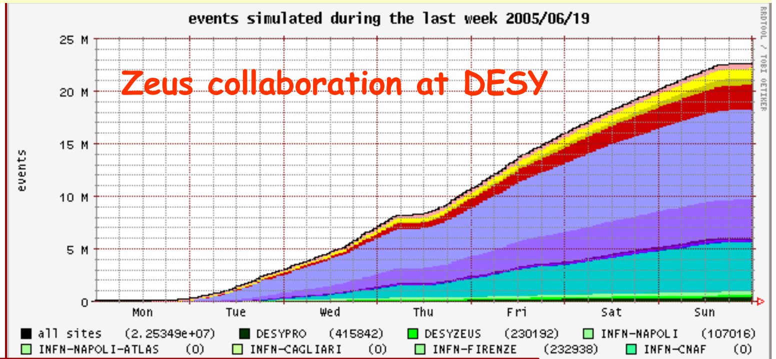




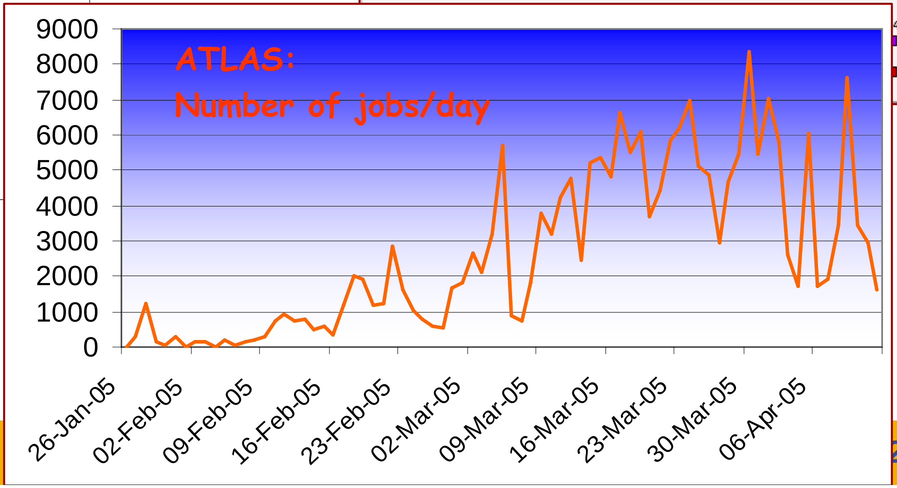
LCG sustained data transfers using FTS; in excess of 500 MB/s



WISDOM data challenge

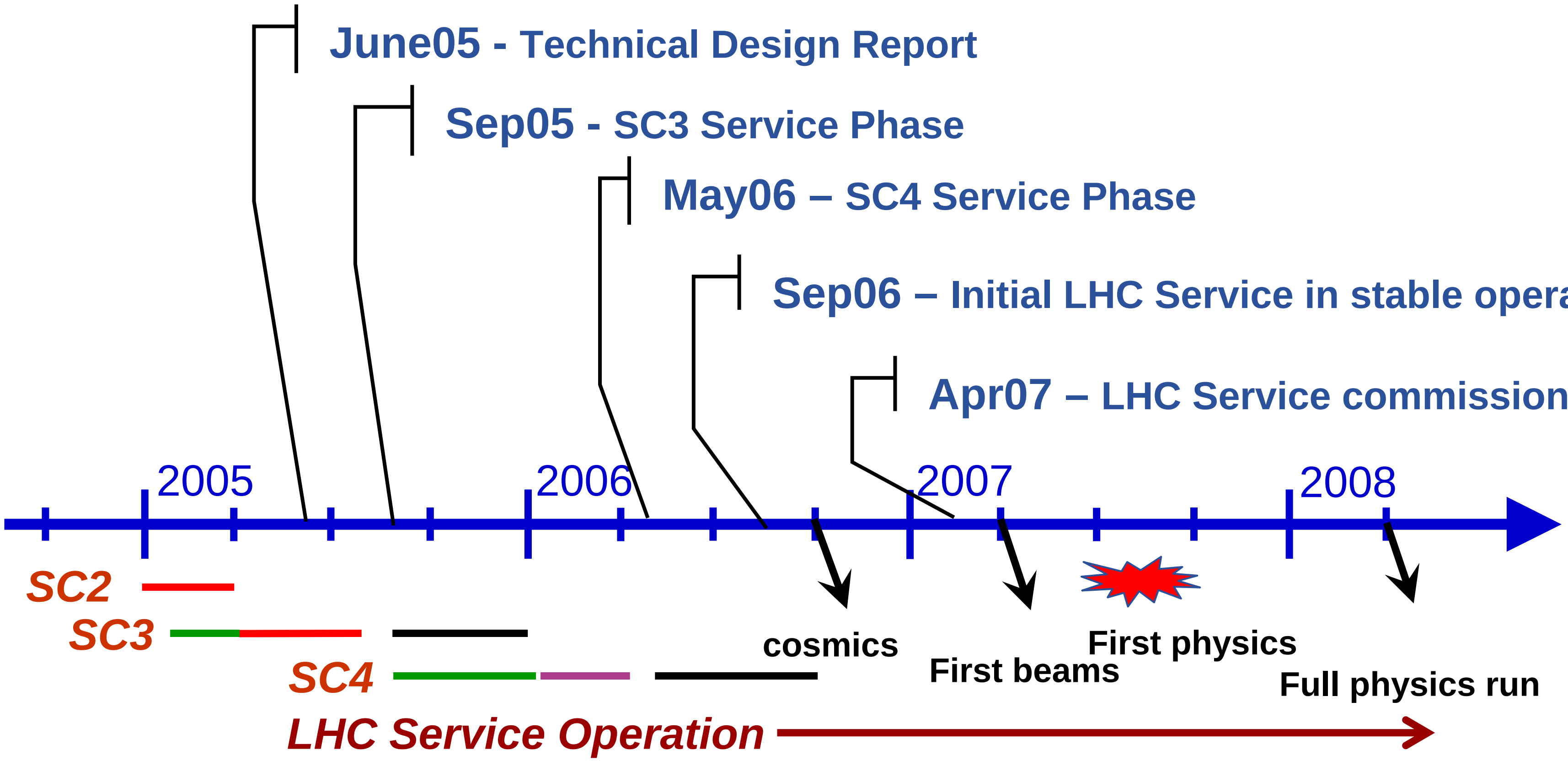


Zeus collaboration at DESY



ATLAS:
Number of jobs/day

LCG Service Challenges – ramp up to start-up service



June05 - Technical Design Report

Sep05 - SC3 Service Phase

May06 – SC4 Service Phase

Sep06 – Initial LHC Service in stable operation

Apr07 – LHC Service commissioned

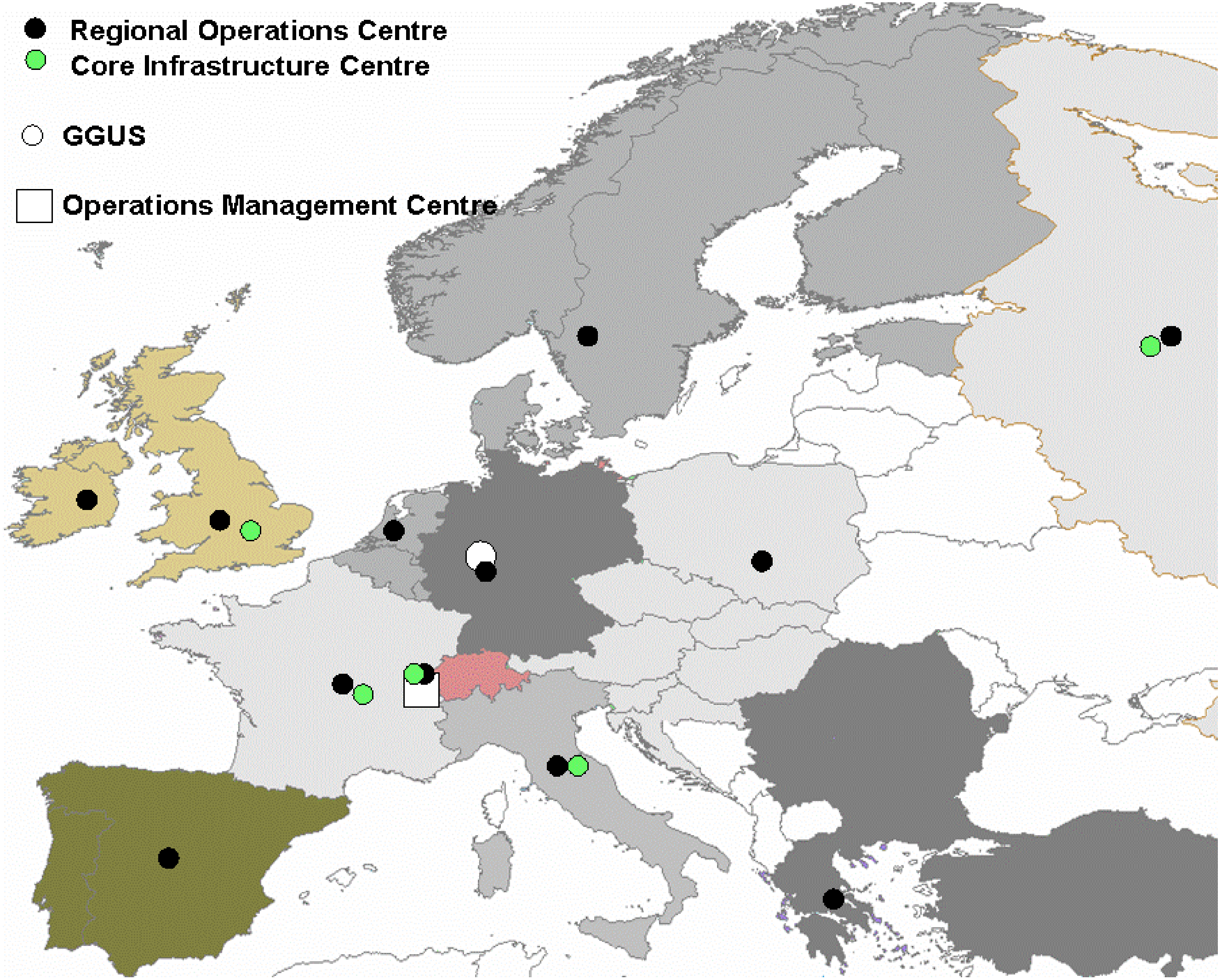
SC2 – Reliable data transfer (disk-network-disk) – 5 Tier-1s, aggregate 500 MB/sec sustained at CERN

SC3 – Reliable base service – most Tier-1s, some Tier-2s – basic experiment software chain – grid data throughput 500 MB/sec, including mass storage (~25% of the nominal final throughput for the proton period)

SC4 – All Tier-1s, major Tier-2s – capable of supporting full experiment software chain inc. analysis – sustain nominal final grid data throughput

LHC Service in Operation – September 2006 – ramp up to full operational capacity by April 2007 – capable of handling twice the nominal data throughput

SA1: Operations Structure


● Regional Operations Centre
● Core Infrastructure Centre
○ GGUS
□ Operations Management Centre

Operations Management Centre (OMC):

- At CERN – coordination etc

Core Infrastructure Centres (CIC)

- Manage daily grid operations – oversight, troubleshooting
  - “Operator on Duty”
- Run infrastructure services
- Provide 2nd level support to ROCs
- UK/I, Fr, It, CERN, Russia, Taipei

Regional Operations Centres (ROC)

- Front-line support for user and operations issues
- Provide local knowledge and adaptations
- One in each region – many distributed

User Support Centre (GGUS)

- In FZK: provide single point of contact (service desk), portal

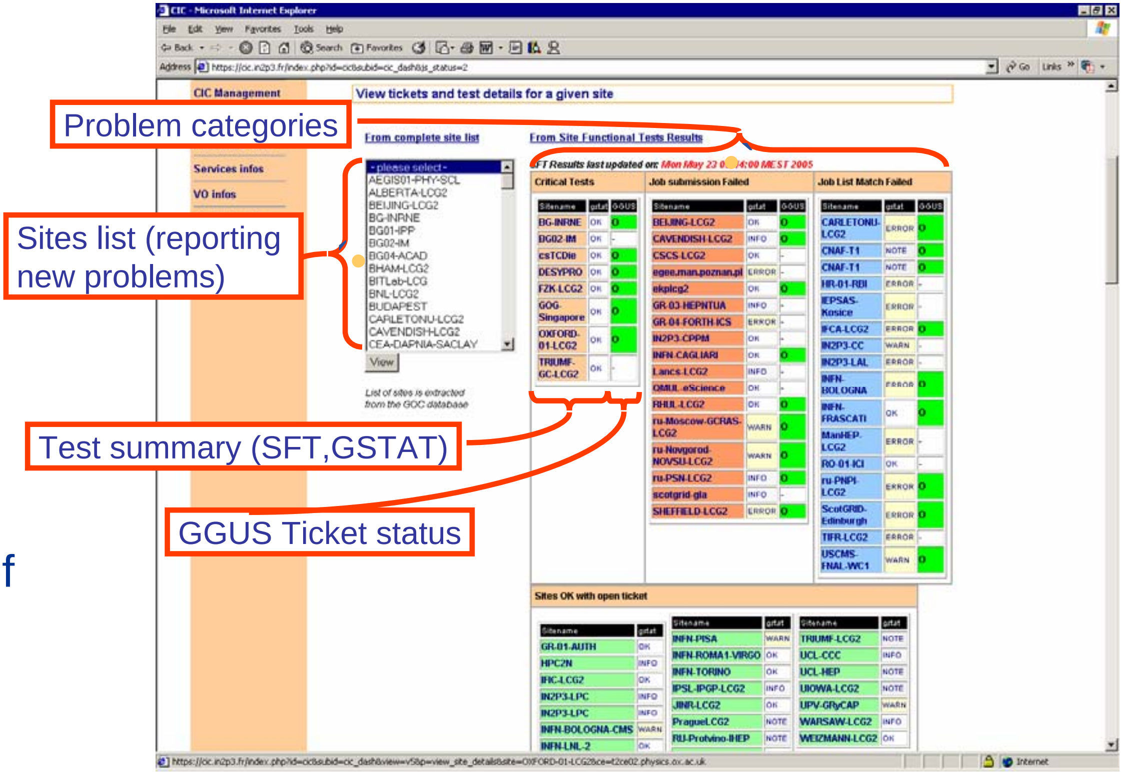
Operations Process

- **CIC – on – duty (grid operator on duty)**
  - Started November 2004
  - 6 teams working in weekly rotation
    - CERN, IN2P3, INFN, UK/I, Ru,Taipei
  - Crucial in improving site stability and management
- **Operations coordination**
  - Weekly operations meetings
  - Regular ROC, CIC managers meetings
  - Series of EGEE Operations Workshops
    - Nov 04, May 05, Sep 05
    - Last one was a joint workshop with Open Science Grid
  - These have been extremely useful
    - Will continue in Phase II
    - Bring in related infrastructure projects – coordination point
    - Continue to arrange joint workshops with OSG (and others?)
- **Geographically distributed responsibility for operations:**
  - There is no “central” operation
  - Tools are developed/hosted at different sites:
    - GOC DB (RAL), SFT (CERN), GStat (Taipei), CIC Portal (Lyon)
- **Procedures described in Operations Manual**

- *Improvement in site stability and reliability is due to:*
  - *CIC on duty oversight and strong follow-up*
  - *Site Functional Tests, Information System monitor*

Operations tools: Dashboard

- **Many complementary monitoring tools, 2 important tools:**
  - Site Functional Tests (SFT)
  - Information System monitor (GStat)
- **Dashboard provides top level view of problems:**
  - Integrated view of monitoring tools (summary) - shows only failures and assigned tickets
  - Detailed site view with table of open tickets and links to monitoring results
  - Single tool for ticket creation and notification emails with detailed problem categorisation and templates
  - Ticket browser with highlighting expired tickets


CIC - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address https://cic.in2p3.fr/index.php?id=cic&subid=cic_dash&s_status=2
CIC Management
Services infos
VO infos
View
Internet

Problem categories

Sites list (reporting new problems)

Test summary (SFT,GSTAT)

GGUS Ticket status

View tickets and test details for a given site

From complete site list

- please select -
AEGIS01-PHY-SCL
ALBERTA-LCG2
BEIJING-LCG2
BG-INRNE
BG01-IPP
BG02-IM
BG04-ACAD
BHAM-LCG2
BITLab-LCG
BNL-LCG2
BUDAPEST
CARLETONU-LCG2
CAVENDISH-LCG2
CEA-DAPNIA-SACLAY

List of sites is extracted from the GOC database

From Site Functional Tests Results

SFT Results last updated on: Mon May 23 0 4:00 MEST 2005

Critical Tests

Sitename	gstat	GGUS
BG-INRNE	OK	O
BG02-IM	OK	-
csTCDie	OK	O
DESYPRO	OK	O
FZK-LCG2	OK	O
GOG-Singapore	OK	O
OXFORD-01-LCG2	OK	O
TRIUMF-GC-LCG2	OK	-

Job submission Failed

Sitename	gstat	GGUS
BEIJING-LCG2	OK	O
CAVENDISH-LCG2	INFO	O
CSCS-LCG2	OK	-
egee.man.poznan.pl	ERROR	-
ekplcg2	OK	O
GR-03-HEPNTUA	INFO	-
GR-04-FORTH-ICS	ERROR	-
IN2P3-CPPM	OK	-
INFN-CAGLIARI	OK	O
Lancs-LCG2	INFO	-
OMUL-eScience	OK	-
RHUL-LCG2	OK	O
ru-Moscow-GCRAS-LCG2	WARN	O
ru-Novgorod-NOVSU-LCG2	WARN	O
ru-PSN-LCG2	INFO	O
scotgrid-gla	INFO	-
SHEFFIELD-LCG2	ERROR	O

Job List Match Failed

Sitename	gstat	GGUS
CARLETONU-LCG2	ERROR	O
CNAF-T1	NOTE	O
CNAF-T1	NOTE	O
HR-01-RBI	ERROR	-
IEPSAS-Kosice	ERROR	-
IFCA-LCG2	ERROR	O
IN2P3-CC	WARN	-
IN2P3-LAL	ERROR	-
INFN-BOLOGNA	ERROR	O
INFN-FRASCATI	OK	O
ManHEP-LCG2	ERROR	-
RO-01-ICI	OK	-
ru-PNPI-LCG2	ERROR	O
ScotGRID-Edinburgh	ERROR	O
TIFR-LCG2	ERROR	-
USCMS-FNAL-WC1	WARN	O

Sites OK with open ticket

Sitename	gstat
GR-01-AUTH	OK
HPC2N	INFO
IFIC-LCG2	OK
IN2P3-LPC	INFO
IN2P3-LPC	INFO
INFN-BOLOGNA-CMS	WARN
INFN-LNL-2	OK

Sitename	gstat
INFN-PISA	WARN
INFN-ROMA1-VIRGO	OK
INFN-TORINO	OK
IPSL-IPGP-LCG2	INFO
JINR-LCG2	OK
PragueLCG2	NOTE
RU-Protvino-IHEP	NOTE

Sitename	gstat
TRIUMF-LCG2	NOTE
UCL-CCC	INFO
UCL-HEP	NOTE
UIOWA-LCG2	NOTE
UPV-GRyCAP	WARN
WARSAW-LCG2	INFO
WEIZMANN-LCG2	OK

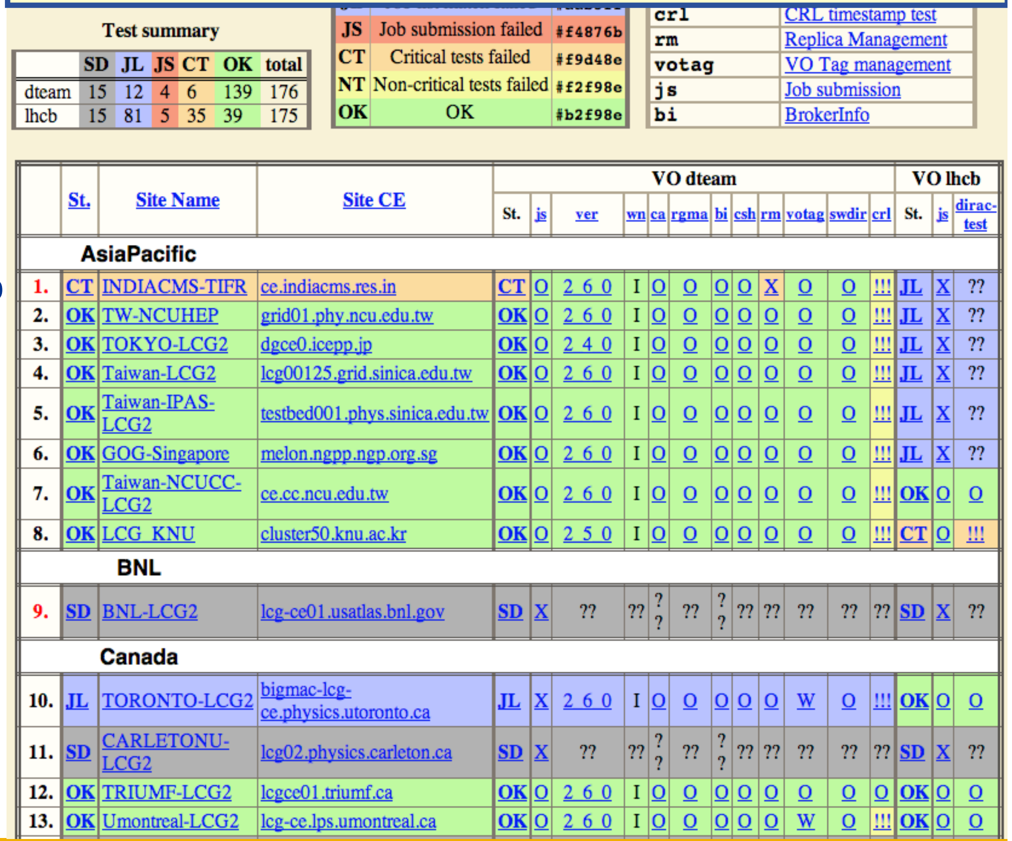
https://cic.in2p3.fr/index.php?id=cic&subid=cic_dash&view=v5&p=view_site_details&site=OXFORD-01-LCG2&ce=t2ce02.physics.ox.ac.uk

- **Well maintained – is adapted quickly to new requirements/suggestions**

Site Functional Tests

- **Site Functional Tests (SFT)**
  - Framework to test services at all sites
  - Shows results matrix
  - Detailed test log available for troubleshooting and debugging
  - History of individual tests is kept
  - Can include VO-specific tests (e.g. sw environment)
  - SFT's have evolved to become stricter as lessons are learned
  - Normally >80% of sites pass SFTs
    - NB of 180 sites, some are not well managed
- **Freedom of Choice tool (FCR)**
  - Uses results of SFT
  - Allows apps to select good sites according to their criteria
  - Selection of "critical" tests for each VO to define which sites are good/bad
  - VO can select set of functional tests that it requires
  - Can white- or black-list sites
  - Operator can remove site from production
- **SFT framework and FCR tool provide dynamic selection of "good" sites**

- Very important in stabilising sites:
  - Apps use only good sites
  - Bad sites are automatically excluded
  - Sites work hard to fix problems



Test summary

	SD	JL	JS	CT	OK	total
dteam	15	12	4	6	139	176
lhcb	15	81	5	35	39	175

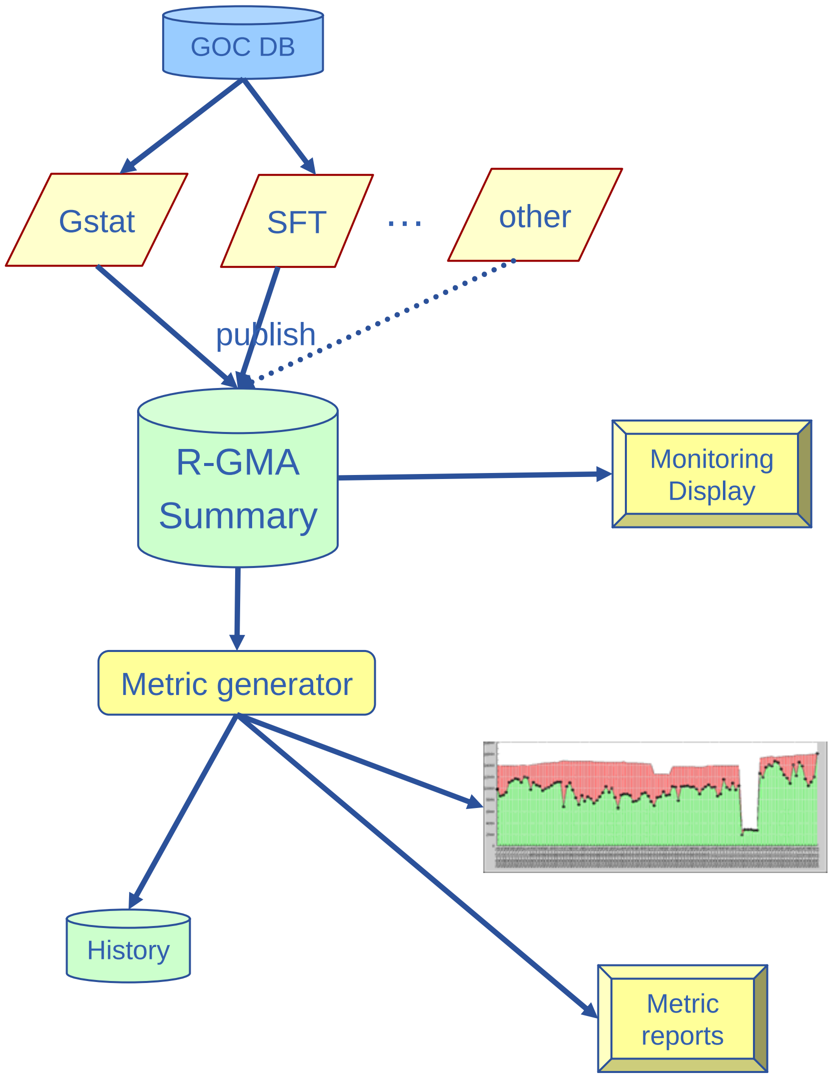
JS	Job submission failed	#f4876b
CT	Critical tests failed	#f9d48e
NT	Non-critical tests failed	#f2f98e
OK	OK	#b2f98e

crl	CRL timestamp test
rm	Replica Management
votag	VO Tag management
js	Job submission
bi	BrokerInfo

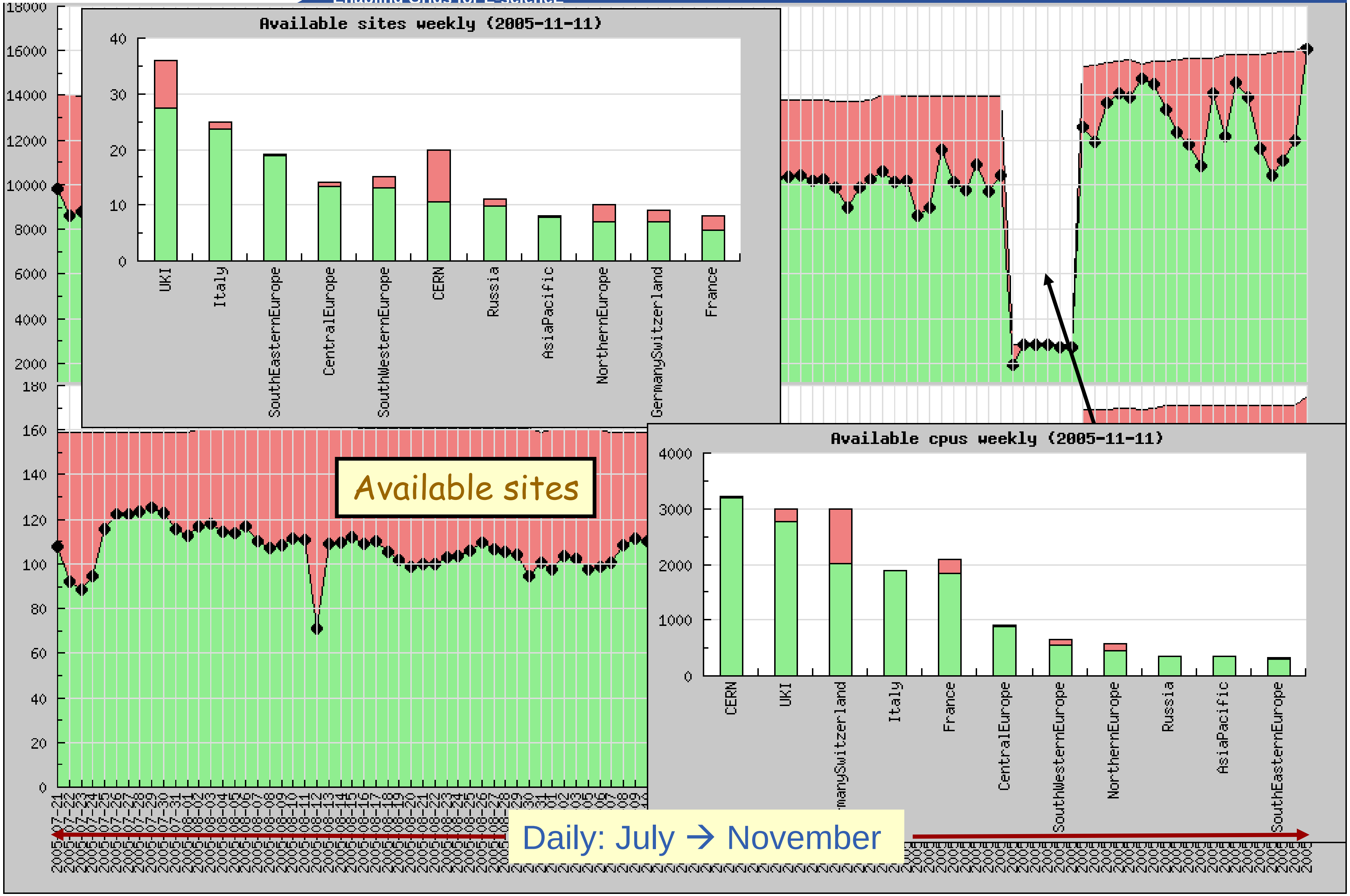
				VO dteam												VO lhcb		
	St.	Site Name	Site CE	St.	js	ver	wn	ca	rgma	bi	csh	rm	votag	swdir	crl	St.	js	dirac-test
	AsiaPacific																	
1.	CT	INDIACMS-TIFR	ce.indiacms.res.in	CT	O	2 6 0	I	O	O	O	O	X	O	O	!!!	JL	X	??
2.	OK	TW-NCUHEP	grid01.phy.ncu.edu.tw	OK	O	2 6 0	I	O	O	O	O	O	O	O	!!!	JL	X	??
3.	OK	TOKYO-LCG2	dgce0.icepp.jp	OK	O	2 4 0	I	O	O	O	O	O	O	O	!!!	JL	X	??
4.	OK	Taiwan-LCG2	lcg00125.grid.sinica.edu.tw	OK	O	2 6 0	I	O	O	O	O	O	O	O	!!!	JL	X	??
5.	OK	Taiwan-IPAS-LCG2	testbed001.phys.sinica.edu.tw	OK	O	2 6 0	I	O	O	O	O	O	O	O	!!!	JL	X	??
6.	OK	GOG-Singapore	melon.ngpp.ngp.org.sg	OK	O	2 6 0	I	O	O	O	O	O	O	O	!!!	JL	X	??
7.	OK	Taiwan-NCUCC-LCG2	ce.cc.ncu.edu.tw	OK	O	2 6 0	I	O	O	O	O	O	O	O	!!!	OK	O	O
8.	OK	LCG_KNU	cluster50.knu.ac.kr	OK	O	2 5 0	I	O	O	O	O	O	O	O	!!!	CT	O	!!!
	BNL																	
9.	SD	BNL-LCG2	lcg-ce01.usatlas.bnl.gov	SD	X	??	??	??	??	??	??	??	??	??	??	SD	X	??
	Canada																	
10.	JL	TORONTO-LCG2	bigmac-lcg-ce.physics.utoronto.ca	JL	X	2 6 0	I	O	O	O	O	O	W	O	!!!	OK	O	O
11.	SD	CARLETONU-LCG2	lcg02.physics.carleton.ca	SD	X	??	??	??	??	??	??	??	??	??	??	SD	X	??
12.	OK	TRIUMF-LCG2	lcgce01.triumf.ca	OK	O	2 6 0	I	O	O	O	O	O	O	O	O	OK	O	O
13.	OK	Umontreal-LCG2	lcg-ce.lps.umontreal.ca	OK	O	2 6 0	I	O	O	O	O	O	W	O	!!!	OK	O	O

Monitoring Integration in R-GMA

- R-GMA is used as the "universal bus" for monitoring information
- SFT and GStat both publish results to R-GMA using common schema
- GOC DB source of:
  - Sites and nodes to monitor,
  - Status (downtime, etc.)
- Scalability:
  - Currently >170 sites
  - About 3.5M tuples for 1 month history with full detail
  - After one month only summary information
- Aggregate views →
  - Dashboard, high level monitors
  - Eventually automated alarms
- Summary information
  - Generate metrics: site availability
- Framework – longer term
  - Include results from various tools
  - Aggregate the disparate data
  - Generate alarms



Evolution of SFT metric



Available sites

Daily: July → November

Service measurement – extending the metrics

Service	***Class***	***Comment***
SRM 2.1	C	Monitoring of SE
LFC	C/H	
FTS	C	Base on SC experience
CE	C	Monitored by SFT now
RB	C	Job monitor exists
Top level BDII	C	Can be included in Gstat
Site BDII	H	Monitored by Gstat
MyProxy	C	
VOMS	H	
R-GMA	H	

C: Critical service
H: High availability

Effort identified in various ROCs to provide availability tests for each service

Will all be integrated into SFT framework

First approach to SLA:

- each Class (C, H, etc) defines required service availability

Checklist for a new service

- **User support procedures (GGUS)**
  - Troubleshooting guides + FAQs
  - User guides
- **Operations Team Training**
  - Site admins
  - CIC personnel
  - GGUS personnel
- **Moni**
  - S
  - F
- **Acco**
  - U
- **Service Parameters**
  - Scope - Global/Local/Regional
  - SLAs
  - Impact of service outage
  - Security implications
- **Contact Info**
  - Developers
  - Support Contact
  - Escalation procedure to developers
- **Interoperation**
  - Documented issues

- **First level support procedures**
  - How to start/stop/restart service
  - How to check it's up
  - Which logs are useful to send to CIC/Developers
    - and where they are
- **Tools for CIC to spot problems**
  - GIIS monitor validation rules (e.g. only one "global" component)
  - Definition of normal behaviour
    - Metrics
- **CIC Dashboard**
  - Alarms
- **Deployment Info**
  - RPM list
  - Configuration details
  - Security audit

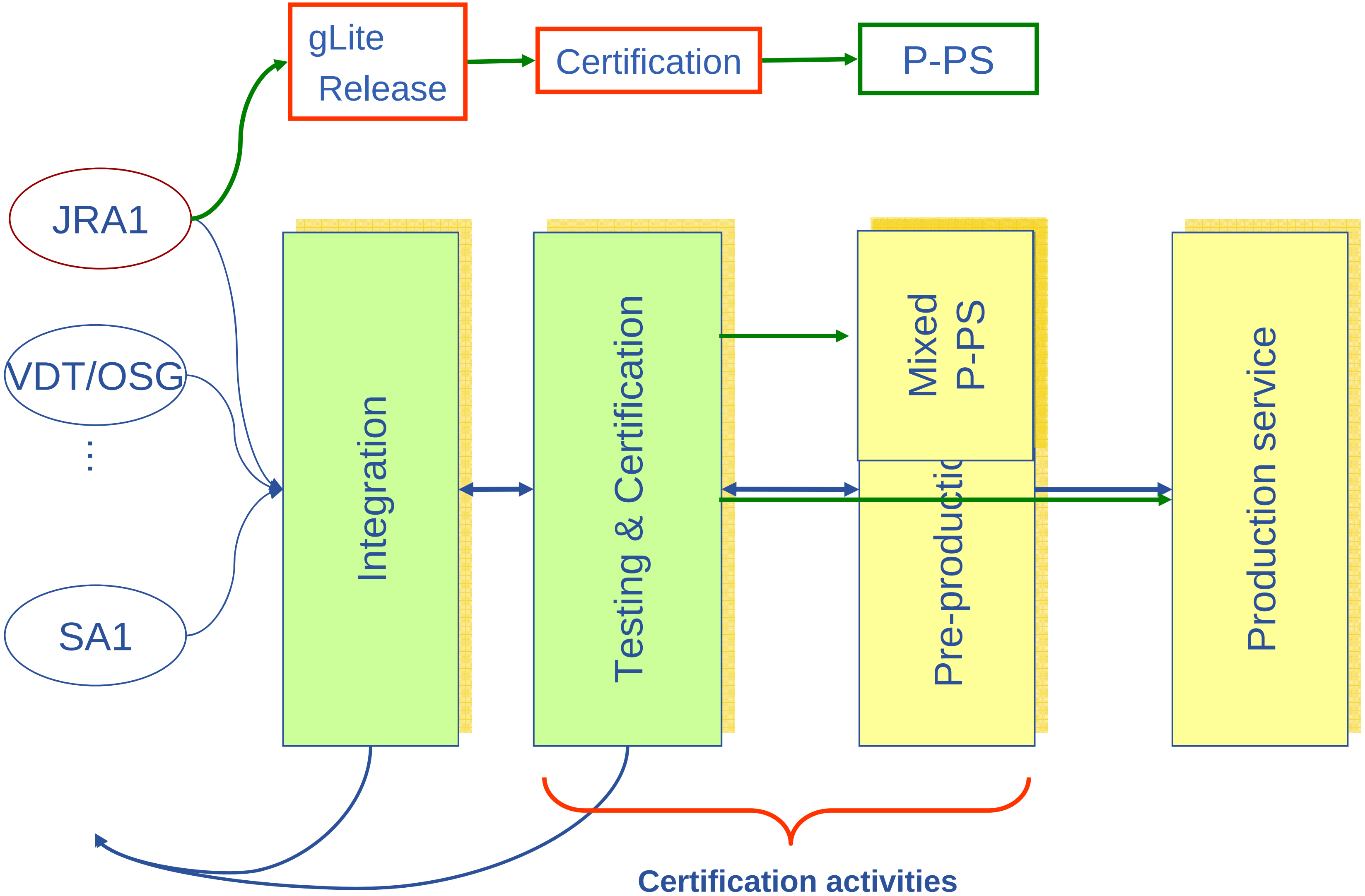
➢ **This is what is takes to make a reliable production service from a middleware component**

➢ **Not much middleware is delivered with all this … yet**

Certification and deployment

- **Deployment process has improved significantly:**
  - Significant effort to improve the deployment process – better separation of functional improvements from critical updates
  - Simplified installation and configuration tools – made life much simpler for administrators
  - Wider deployment testing before release; also pre-production
  - GGUS coordinates problem follow up
- **Certification:**
  - Increased effort was identified (UK, INFN) to address lack of testing of new gLite components
  - Parallel processes to speed up gLite testing:
    - Production certification
    - “pure” gLite certification
    - Mixed (LCG-2.x + gLite) → this will become primary strategy
  - gLite 1.4.1 is being certified now

Moving components to production



Certification activities

Lessons from Deployment

- **Goals: (tension between …)**
  - Applications: Rapid updates – new functionality, bug fixes
  - Sites: Fixed schedules – to ensure good planning and response
  - Deployment team: Sufficient certification and testing – to ensure quality
  - Rapid reaction by sites to new releases is desired by applications and deployment team
- **Lessons learned**
  - **EGEE production service is a grid of independent federations**
    - **ROCs schedule upgrades in their region**
    - New releases need a few months to reach 80% site deployment
  - Early announcement of new releases needed
    - To allow time for external deployment testing (→ p-ps)
  - Release definition non-trivial with 3 months intervals
    - Closing door for changes is almost impossible
  - Certification Tests need to be extended (performance tests)
  - Patches have to come with a standard set of information
    - Ports, variables, config changes …
  - Updates work quite well
- **Now: Integrate JRA1 and SA1 processes**
  - Take into account the experiences gained over past 4 years
  - Ensure (TCG) priorities are driven by the applications

Pre-production service

- **Current P-PS is a “pure” gLite service**
  - BDII, SRM SE and MyProxy server are also needed.
- **The P-PS is available and used by many VOs**
  - HEP VOs (CMS, ATLAS, Alice, LHCb)
  - ARDA
  - BioMed
  - egeode
  - NA4 (testing)
  - DILIGENT
  - SWITCH
- **Currently upgrading from gLite 1.4 to gLite 1.4.1 (a major patch)**
  - As the service is now in use, upgrades are planned and phased to minimize the impact to users.
- **Currently preparing to move the day-to-day operations of the P-PS to the production operations team**
  - SFT monitoring is now in place
  - All P-PS sites are now correctly entered in the GOC database
  - Production operation processes are being implemented for the P-PS
- **Planning is under way for moving the P-PS from being a pure gLite service to being a true pre-production service which closely mirrors production**

P-PS: Resources

ROC	Site	CPUs	SE	Core Services			
Asia-Pacific	ASGC	0		WMS			
CE	CYFRONET	3					
CERN	CERN	54	DPM	WMS	FTS	VOMS (production)	
DE/CH	FZK	2					
France	IN2P3	4			FTS	VOMS	
Italy	CNAF	150	DPM	WMS		VOMS	BDII
Italy	INFN-Padova	100					
NE	NIKHEF	0				VOMS	
SEE	UoM	2					
SEE	UPATRAS	3		WMS			
SWE	CESGA	2					R-GMA
SWE	IFIC	1	Castor				
SWE	LIP	2	DPM				MyProxy
SWE	PIC	180	Castor	WMS			FireMan
UK/I	ScotGrid-Glasgow	0			FTS		

- **PIC, CNAF, Padova and CERN have given access to production batch farms**
  - PIC, Padova and CNAF running LCG WNs; CERN running gLite WNs.
  - CERN: queue to production batch farm is currently restricted to 50 jobs. This restriction can be removed, increasing the number of CPUs at CERN to ~1,500.
- **To date, over 1.5 million jobs have been submitted to the P-PS WMSs.**

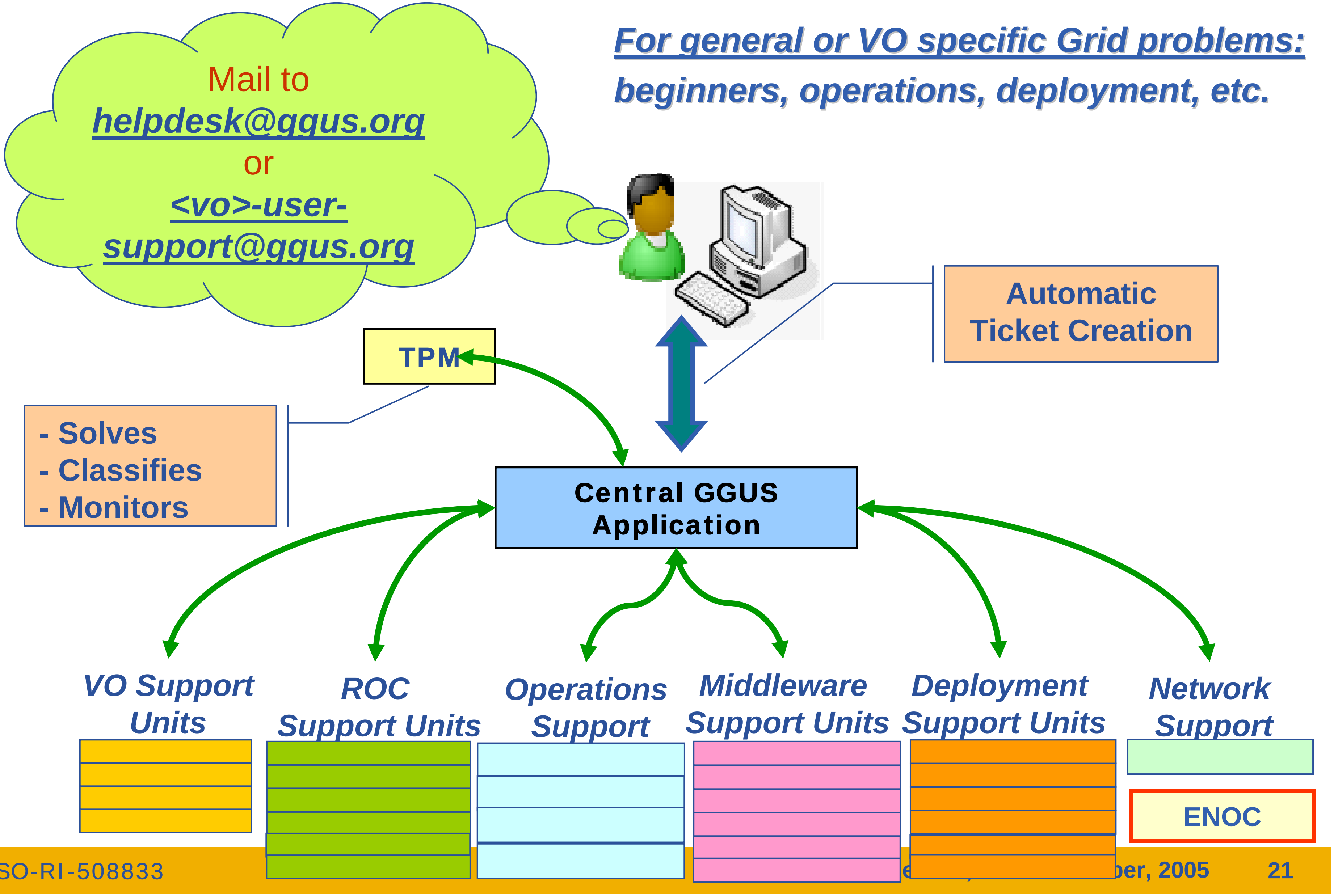
User support

- **User Support in EGEE (helpdesk, call-centre)**
  - Regional support with central coordination (GGUS @ FZK)
  - GGUS platform connects:
    - CICs, ROCs, VOs, service teams providing support
    - Middleware developers and support
    - Networking activities (training etc).
  - Ticket Process Managers – oversee problem lifecycle
    - Ensure problems assigned and followed up
    - Problem resolution by volunteer experts – harness informal processes
  - Users can report via local helpdesks, ROC helpdesk, VO helpdesk, or to GGUS
  - Ticket traffic increasing
    - Now: Change in users from a few, experienced, production managers to general users (low quality of tickets)
- **VO support**
  - Other aspect of user support – direct support to apps to integrate with grid middleware
  - Application driven process: set up several task forces to implement this (follow successful model in LCG)

User Support – GGUS

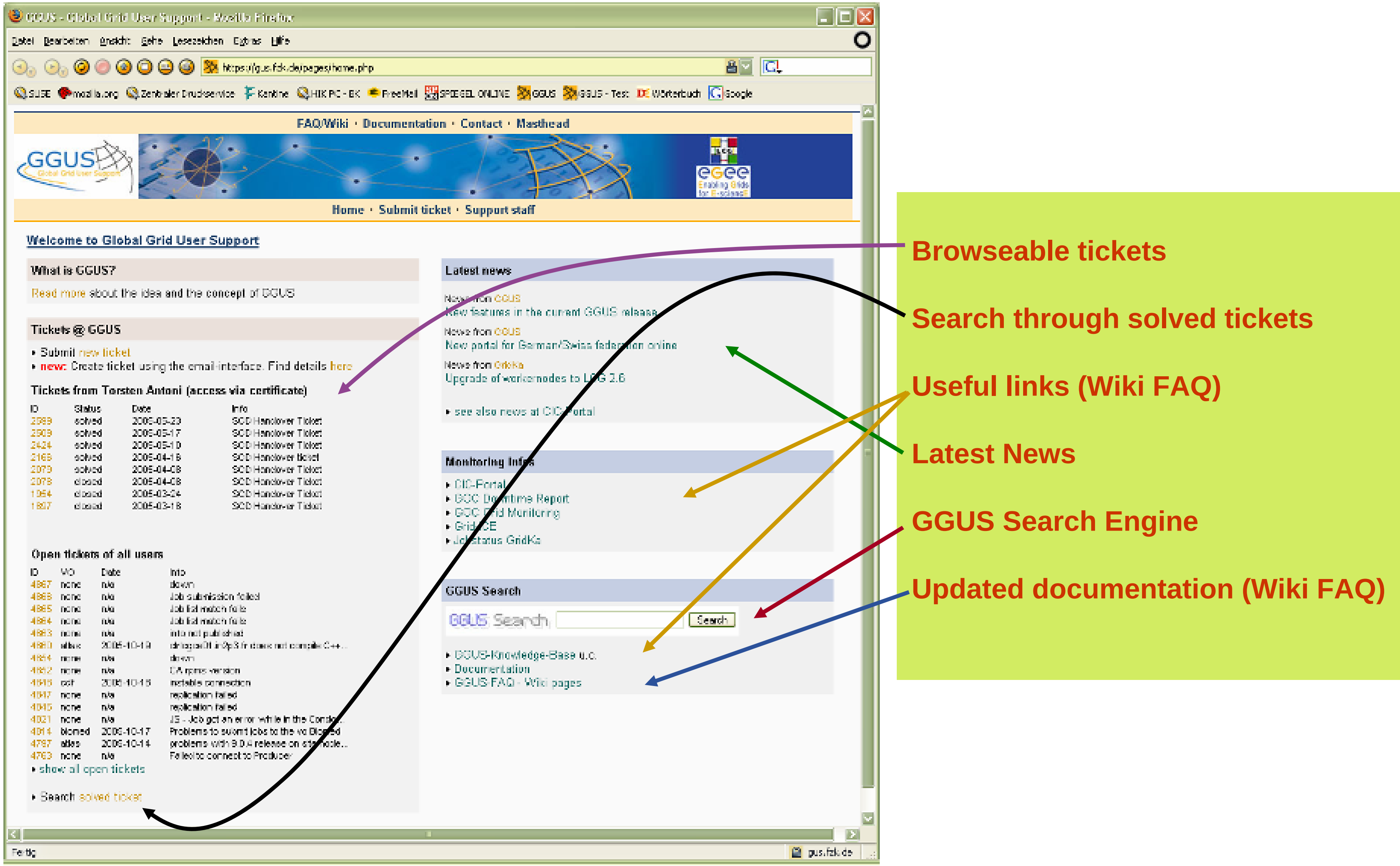
For general or VO specific Grid problems:

beginners, operations, deployment, etc.



Mail to
helpdesk@ggus.org
or
<vo>-user-support@ggus.org

GGUS Portal: user services


GGUS - Global Grid User Support - Mozilla Firefox
Datei Bearbeiten Ansicht Gehe Lesezeichen Extras Hilfe
https://ggus.fzk.de/pages/home.php
SUSE mozilla.org Zentraler Druckservice Kantine HIK PC - EK FreeMail SPIEGEL ONLINE GGUS GGUS - Test Wörterbuch Google
FAQ/Wiki · Documentation · Contact · Masthead
GGUS Global Grid User Support
egee Enabling Grids for E-sciencE
Home · Submit ticket · Support staff
Fertig
ggus.fzk.de

Welcome to Global Grid User Support

What is GGUS?

Read more about the idea and the concept of GGUS

Tickets @ GGUS

- Submit new ticket
- new: Create ticket using the email-interface. Find details here

Tickets from Torsten Antoni (access via certificate)

ID	Status	Date	Info
2589	solved	2005-05-23	SCD Handover Ticket
2509	solved	2005-05-17	SCD Handover Ticket
2424	solved	2005-05-10	SCD Handover Ticket
2168	solved	2005-04-18	SCD Handover ticket
2079	solved	2005-04-08	SCD Handover Ticket
2078	closed	2005-04-08	SCD Handover Ticket
1954	closed	2005-03-24	SCD Handover Ticket
1807	closed	2005-03-18	SCD Handover Ticket

Open tickets of all users

ID	VO	Date	Info
4867	none	n/a	down
4866	none	n/a	Job submission failed
4865	none	n/a	Job list match fails
4864	none	n/a	Job list match fails
4863	none	n/a	info not published
4860	atlas	2005-10-19	dirisgrid01.in2p3.fr does not compile C++...
4854	none	n/a	down
4852	none	n/a	CA rpms version
4848	cdf	2005-10-18	instable connection
4847	none	n/a	replication failed
4845	none	n/a	replication failed
4821	none	n/a	JS - Job got an error while in the Condor...
4814	biomed	2005-10-17	Problems to submit jobs to the vo Biomed
4797	atlas	2005-10-14	problems with 9.0.4 release on site node...
4763	none	n/a	Failed to connect to Producer

- show all open tickets

- Search solved ticket

Latest news

News from GGUS
New features in the current GGUS release

News from GGUS
New portal for German/Swiss federation online

News from GridKa
Upgrade of workernodes to LCG 2.6

- see also news at CIC-Portal

Monitoring Infos

- CIC-Portal
- GOC Downtime Report
- GOC Grid Monitoring
- GridICE
- Jobstatus GridKa

GGUS Search

GGUS Search [ ] Search

- GGUS-Knowledge-Base u.c.
- Documentation
- GGUS-FAQ - Wiki pages

Browseable tickets

Search through solved tickets

Useful links (Wiki FAQ)

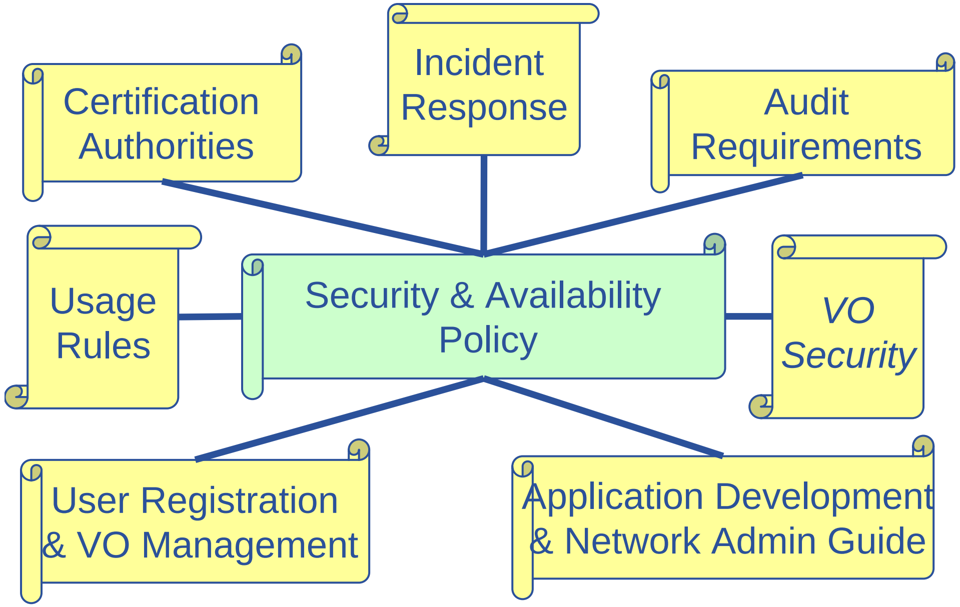
Latest News

GGUS Search Engine

Updated documentation (Wiki FAQ)

Security Policy

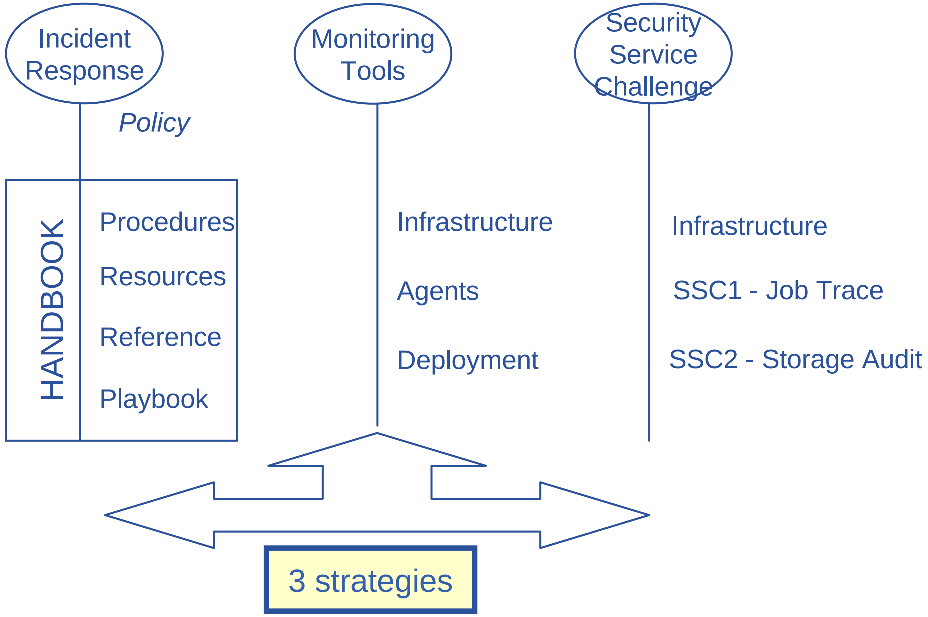
- **Joint Security Policy Group**
  - EGEE with strong input from OSG
  - Policy Set:


Certification Authorities
Incident Response
Audit Requirements
Usage Rules
Security & Availability Policy
VO Security
User Registration & VO Management
Application Development & Network Admin Guide

- **Policy Revision In Progress/Completed**
  - Grid Acceptable Use Policy (AUP)
    - https://edms.cern.ch/document/428036/
    - common, general and simple AUP
    - for all VO members using many Grid infrastructures
      - *EGEE, OSG, SEE-GRID, DEISA, national Grids…*
  - VO Security
    - https://edms.cern.ch/document/573348/
    - responsibilities for VO managers and members
    - VO AUP to tie members to Grid AUP accepted at registration
  - Incident Handling and Response
    - https://edms.cern.ch/document/428035/
    - defines basic communications paths
    - defines requirements (MUSTs) for IR
      - *reporting*
      - *response*
      - *protection of data*
      - *analysis*
    - not to replace or interfere with local response plans

Operational Security Coordination Team (OSCT)

- **OSCT membership → ROC security contacts**
  - What it is not:
    - Not focused on middleware security architecture
    - Not focused on vulnerabilities (see *Vulnerabilities Group*)
  - Focus on Incident Response Coordination
    - Assume it's broken, how do we respond?
    - Planning and Tracking
  - Focus on 'Best Practice'
    - Advice
    - Monitoring
    - Analysis
  - Coordinators for each EGEE ROC
    - plus OSG LCG Tier 1 + Taipei



Vulnerability Group

- **Has been set up this summer (CCLRC lead)**
- **Purpose: inform developers, operations, site managers of vulnerabilities as they are identified and encourage them to produce fixes or to reduce their impact**
- **Set up (private!) database of vulnerabilities**
  - To inform sites and developers
- **Urgent action → OSCT to manage**
- **After reaction time (45 days)**
  - Vulnerability and risk analysis given to OSCT to define action – publication?
  - Will not publish vulnerabilities with no solution
- **Intend to report progress and statistics on vulnerabilities by middleware component and response of developers**
- **Balance between open responsible public disclosure and creating security issues with precipitous publication**

Interoperability

- **EGEE – OSG:**
  - Job submission demonstrated in both directions
  - Done in a sustainable manner
  - EGEE BDII and GIP deployed at OSG sites
    - Will also go into VDT
  - EGEE client tools installed by a grid job on OSG sites
    - Small fixes to job managers to set up environment correctly
- **EGEE – ARC:**
  - 2 workshops held (September, November) to agree strategy and tasks
  - Longer term: want to agree standard interfaces to grid services
  - Short term:
    - EGEE→ARC: Try to use Condor component that talks to ARC CE
    - ARC→EGEE: discussions with EGEE WMS developers to understand where to interface
  - Default solution: NDGF acts as a gateway

Interoperation

- **Goal: to improve level of “round-the-clock” operational coverage**
- **OSG have been to all of the EGEE operations workshops**
  - Latest was arranged as a joint workshop
- **Can we share operational oversight?**
  - Gain more coverage (2 shifts/day)
- **Share monitoring tools and experience**
  - Site Functional tests (SFT)
  - Common application environment tests
  - Work on common schema for monitoring data started
- **User support workflows – interface**
- **Strong interest from both sides**

- **Now: Write a short proposal of what we can do together**
  - Both EGEE and OSG have effort to work on this
- **Follow up in future operations workshops**

Standards & SA1

- **Interoperation and interoperability**
  - De-facto standards – common understandings/interfaces
    - GT2, GSI, SRM, BDII/GIP (MDS), …
  - Agreement on schema:
    - GLUE 1.2/GLUE 2.0; GGF Usage record for accounting
      - *GLUE 2.0 will unify EGEE, OSG, ARC information schema*
    - Consider: common operations and job monitoring schema
- **Top-down vs bottom-up standards – must keep a balance in production**
  - What is working now (SRM, GLUE) vs what will help in future
  - Must maintain production service while introducing new components that apply standards → slow
- **Operations:**
  - SA1 "Cookbook": summary of choices and experience deploying EGEE → intend to publish to GGF production grids
  - All aspects of operational security are very much collaborative with OSG and others (and very active in GGF)
  - Integration and certification is hard – standard interfaces and protocols should help
- **Operations Workshops**
  - Open to related infrastructure projects (EELA, EUMedGrid, SEE-Grid, … OSG, etc.)
  - Provide practical standardisation forum for which no equivalent in GGF as yet
- **SC05 Interoperability discussions**
  - Integrate bi-lateral interoperability work
  - EGEE/SA1 will contribute its work and experiences

Middleware convergence

- **The current production middleware ("LCG-2") is stable and is daily heavily used**
  - This has to be maintained as new components are added or components replaced
  - This will always be the case – there will always be new or better services coming
  - Thus, the production distribution must evolve in a controlled way that does not break existing applications but that adds new, or improves existing, functionality
- **There is a strong and reliable process in place**
  - Integration, testing, certification, pre-production, production
  - Process constantly evaluated and improved
  - All significant components of gLite 1.4 are either in production (R-GMA, VOMS, FTS) …
  - … or on the pre-production service (CE, WMS, Fireman, gliteIO)
  - Anticipate these being available in production distributions (alongside existing components at first) – by mid-2006 (many sooner)
- **The current LCG and gLite middleware will converge to a single *distribution* called gLite in early 2006**
- **Should not expect (or desire!) a big-bang switch to gLite (or anything else)**
- **Deploying in production any new software is a slow and time-consuming process, this lesson has been learned many times**

SA1: Key points

- **Accomplishments:**
  - SA1 is operating world's largest grid infrastructure for science
  - Significant resources available
  - In use by many real production applications
    - 10K jobs/day
  - Daily operations model is now well established
  - User support process is in place and being used
    - But it is complex !
  - Site stability is better controlled
    - Apps can select good sites
    - Understanding of metrics and what SLA might look like
  - Ports to other architectures now exist
    - IA64, other Linuxes
  - Convergence of middleware stacks under way
    - gLite components reaching production

- **Issues:**
  - Hard to balance:
    - Needs of applications for rapid updates
    - Reliable scheduling wanted by sites
    - Adequate testing and certification
  - Moving new middleware into production is time consuming:
    - Unrealistic expectations
    - Very stressful
    - But software industry knows …
  - Essential to maintain stable production environment
    - While introducing new functionality, new services
    - Backwards compatibility
    - Expensive in resources and support
  - Release of accounting (& other) data
    - some site policies restrict release of per-user data (privacy laws)
    - Accounting, job monitoring, …
  - Introducing new VOs is still too difficult

Plans until end of project

- **Remainder of EGEE**
  - Milestones:
    - MSA1.5 (PM21) – Expanded production grid available (50 sites)
  - Deliverables:
    - DSA1.7 (PM19) – Cookbook – internal review
    - DSA1.8 (PM23) – Assessment of production operation (update of DSA1.4)
    - DSA1.9 (PM21) – Release notes corresponding to MSA1.5
  - Full metrics programme implemented (scope agreed in Pisa, Oct '05)
    - Service availability SLA for LCG (MoU)
  - Deploy major gLite components in production
- **Sustainability**
  - Prepare processes for EGEE-II
  - Re-focus on middleware support and building deployable distributions: Merge integration, testing (JRA1) with integration and certification (SA1) into single team with distributed partners
  - Work with embryonic TCG to ensure application driven priorities reflected in development and deployment priorities

Summary

- **Infrastructure at a scale much larger than anticipated for end of year 2:**
  - 179 sites, 17k CPU, 39 countries
- **Being used at a significant scale for daily production:**
  - Sustaining > 10k jobs per day over many months
  - Many applications, not just HEP
  - Massive sustained data throughput > 500MB/s for 10 days
  - LCG service challenges, Biomed (WISDOM) data challenge
- **Operational oversight – grid "operator on duty"**
  - In place for 1 year, CERN, IN2P3, INFN, CCLRC, Russia, ASGC
  - Improved stability of sites → VO-specific selection of "good" sites
  - Metrics on stability and availability → SLAs
- **Pre-production service available**
  - In use by many applications, as testing ground for gLite
- **gLite components now in deployed middleware distribution**
  - VOMS, R-GMA, FTS, others (WMS) being certified now
- **Interoperability**
  - With OSG demonstrated, work in progress with ARC
  - Shared operational oversight with OSG under discussion