LHCC Referee Meeting

Project Status & Overview

22nd September 2008

Ian Bird
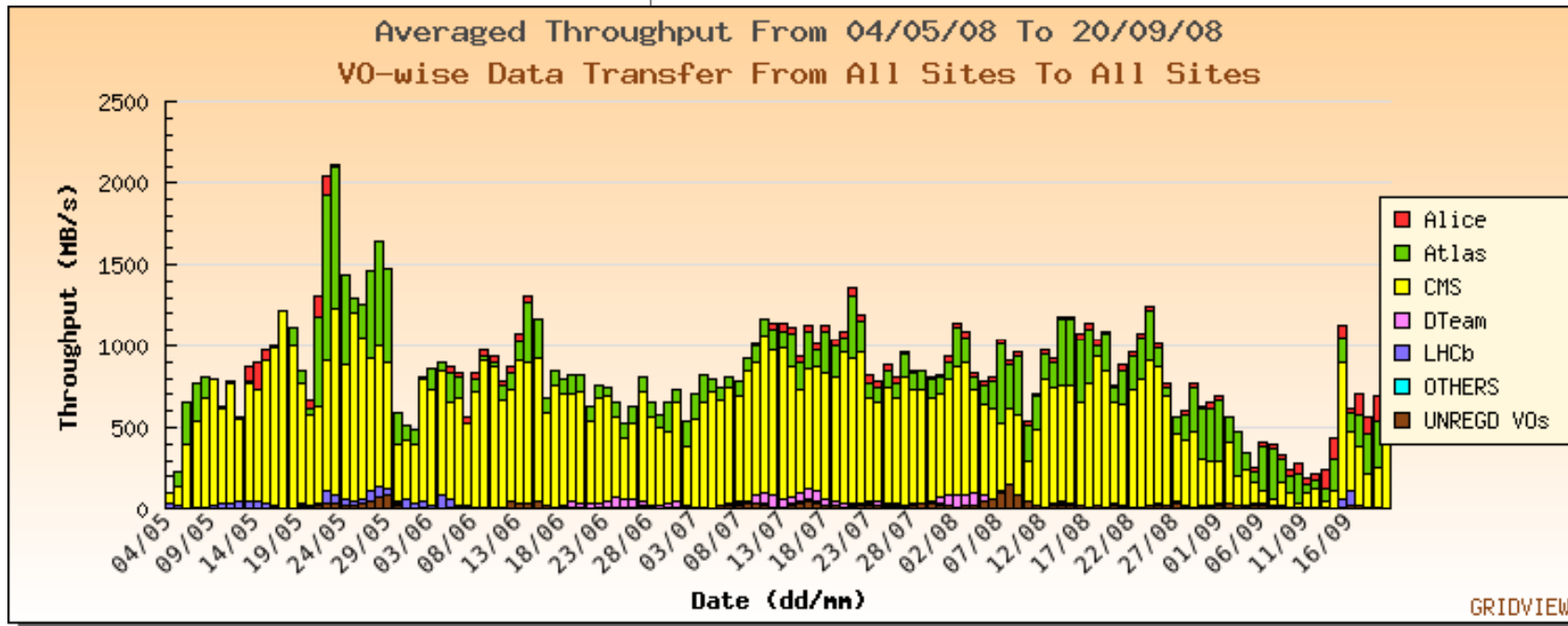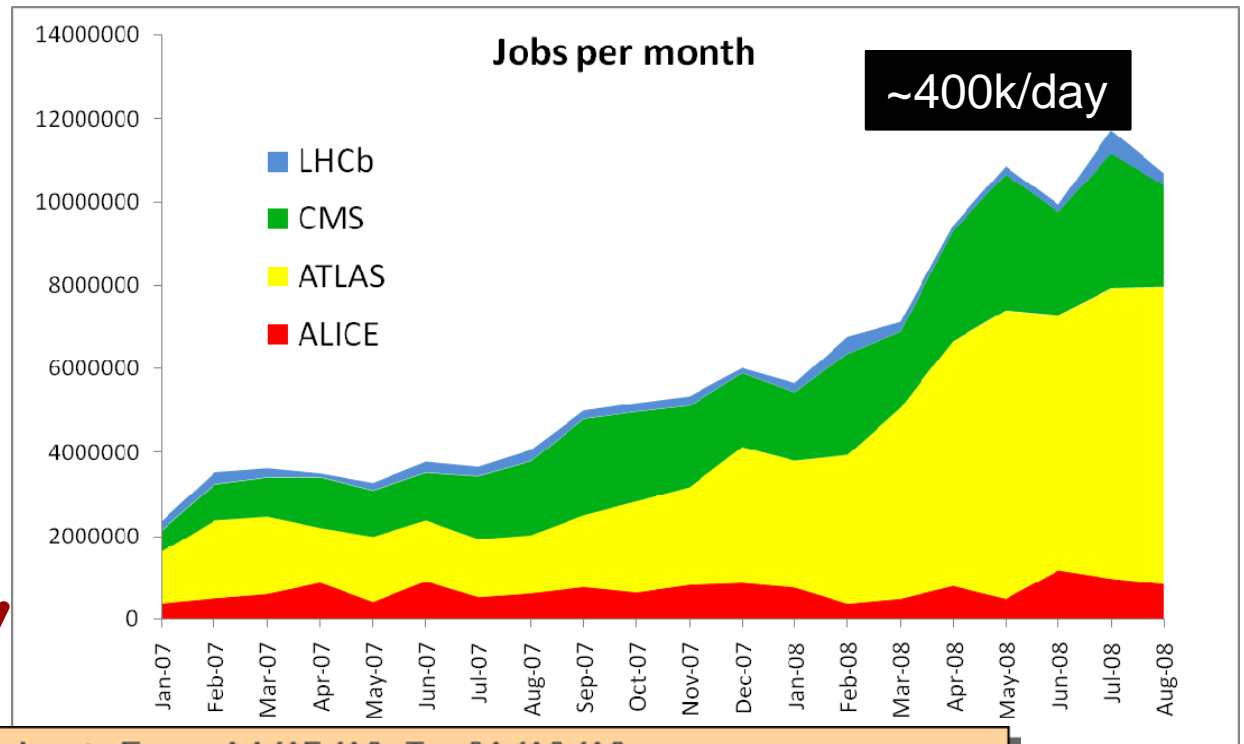**LCG Project Leader**

Since July ...

- Experiments and WLCG have continued in "production mode"
  - Daily operations meetings – with written summaries
  - Main problems trigger post-mortems (see later); MB follow up of specific points as needed
  - Workloads and data transfers have remained at high levels
  - Some data files seen from cosmics, injection tests, Sep 10, ...

- Reasonably sustainable
  - Probably too many significant changes are still going on ... Especially for storage

Ongoing work: jobs and transfers since CCRC May

Jobs per month

~400k/day

- LHCb
- CMS
- ATLAS
- ALICE

Averaged Throughput From 04/05/08 To 20/09/08
VO-wise Data Transfer From All Sites To All Sites

- Alice
- Atlas
- CMS
- DTeam
- LHCb
- OTHERS
- UNREGD VOs

Date (dd/mm)

GRIDVIEW

Storage Services Summary

Recall – 2 main points:

- Outstanding functionality – agreed in short term solutions to be provided by end of 2008
   - In progress

- Operational issues and considerations arising from use for data
    - Addressed in Sep GDB
    - Configuration problems for dCache – at 2 sites, now understood and being addressed
        - Clarified support model – sites should really attend weekly phone conf
    - Operational instabilities – probably largest outstanding problem
        - See post-mortem summary in Tier 1 report
    - Some concern over lack of general ability to test releases (of dCache)
        - But each site is so different that they really have to do pre-production testing before deployment
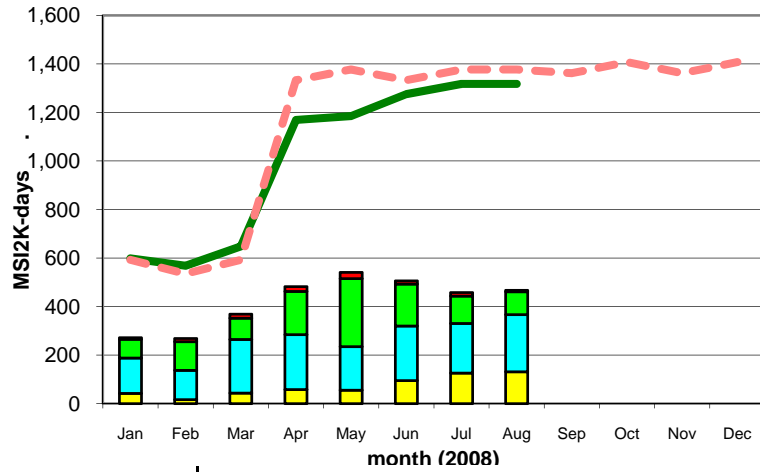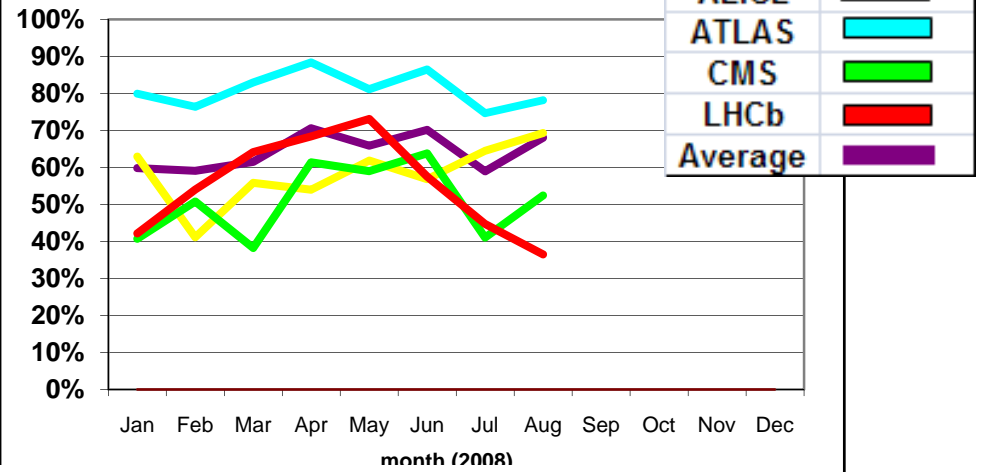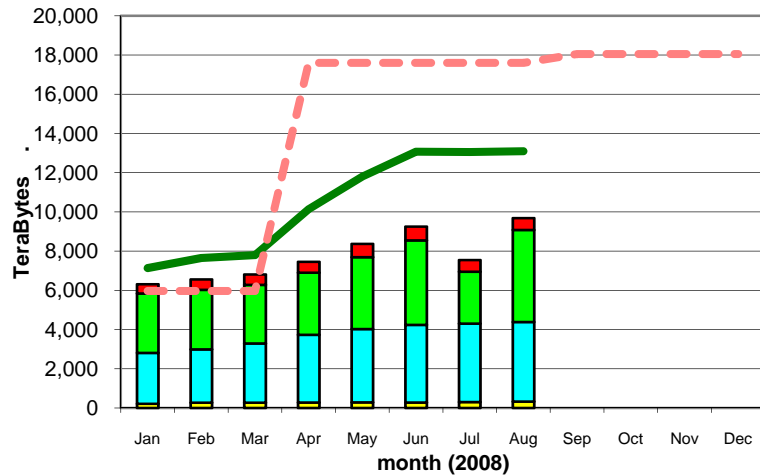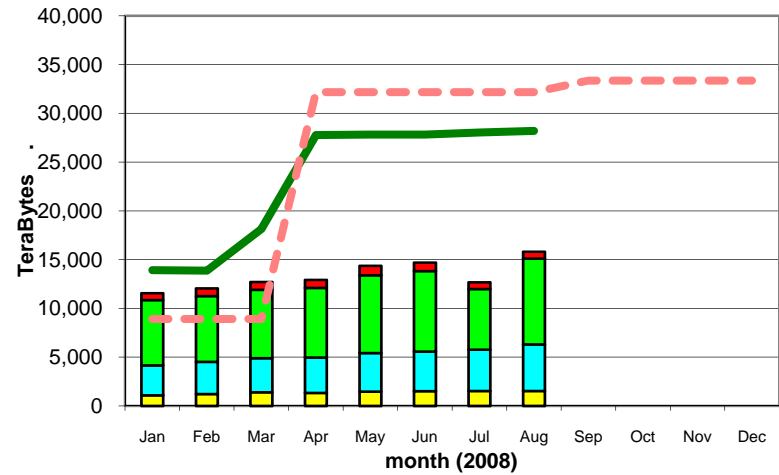
Resources

- Awaiting first RSG reports
  - RSG will formally report to November C-RRB
- Already received request from ATLAS to double 2009 Tier 0 + CAF resources

- BUT:
  - CERN (Tier 0/ CAF) budget is fixed
  - LCG cannot decide/prioritise between allocations to experiments
  - Will need the LHCC and CERN scientific management to define what are the priorities: i.e. Given the budget envelope what fraction should be given to each experiment?
- For other sites (Tier1 and Tier2)
  - The RRB (funding agencies) will note the RSG recommendations and perhaps adjust their pledges – this is very much unknown yet ...

Site reliability: CERN+Tier 1s
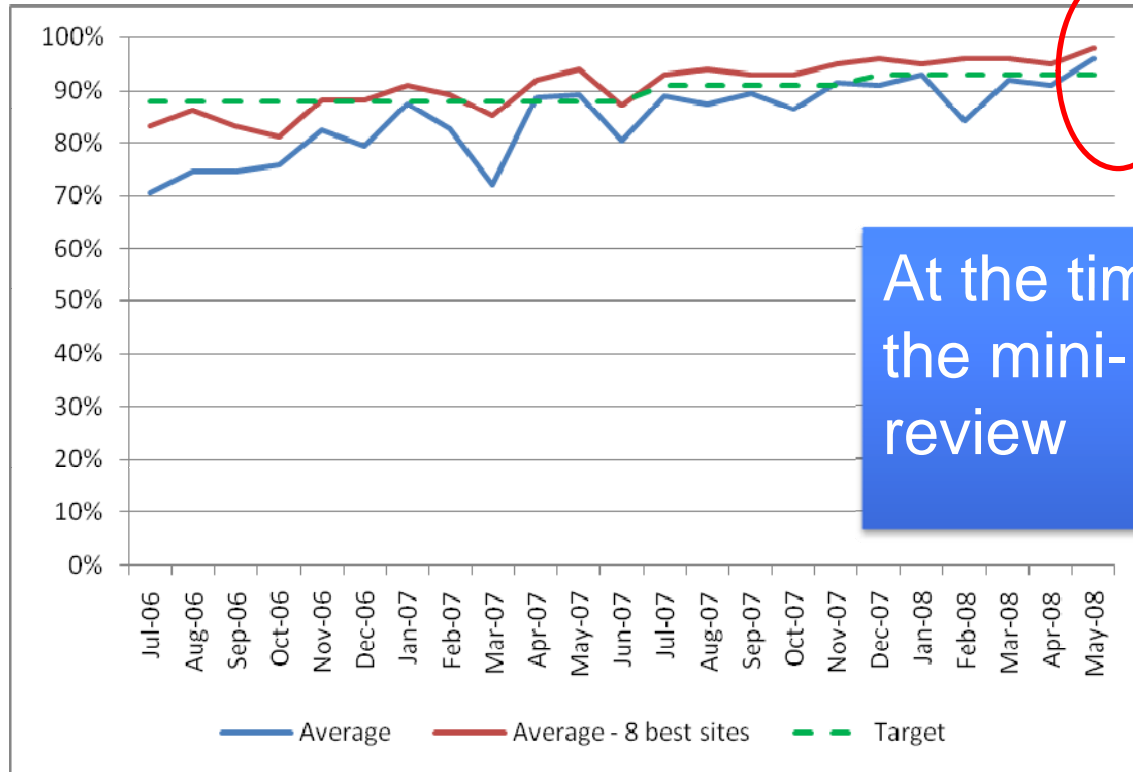
At the time of the mini-review

	Jan 08	Feb 08	Mar 08	Apr 08	May 08
Target	93	93	93	93	93
Average – 8 best site	96	96	96	95	98
Average – all sites	90	85	91	91	96
# above target (+>90% target)	7 +3	7 +3	7 +3	7 +3	11 +1

Site Reliability – CERN + Tier 1s

CCRC'08 ...
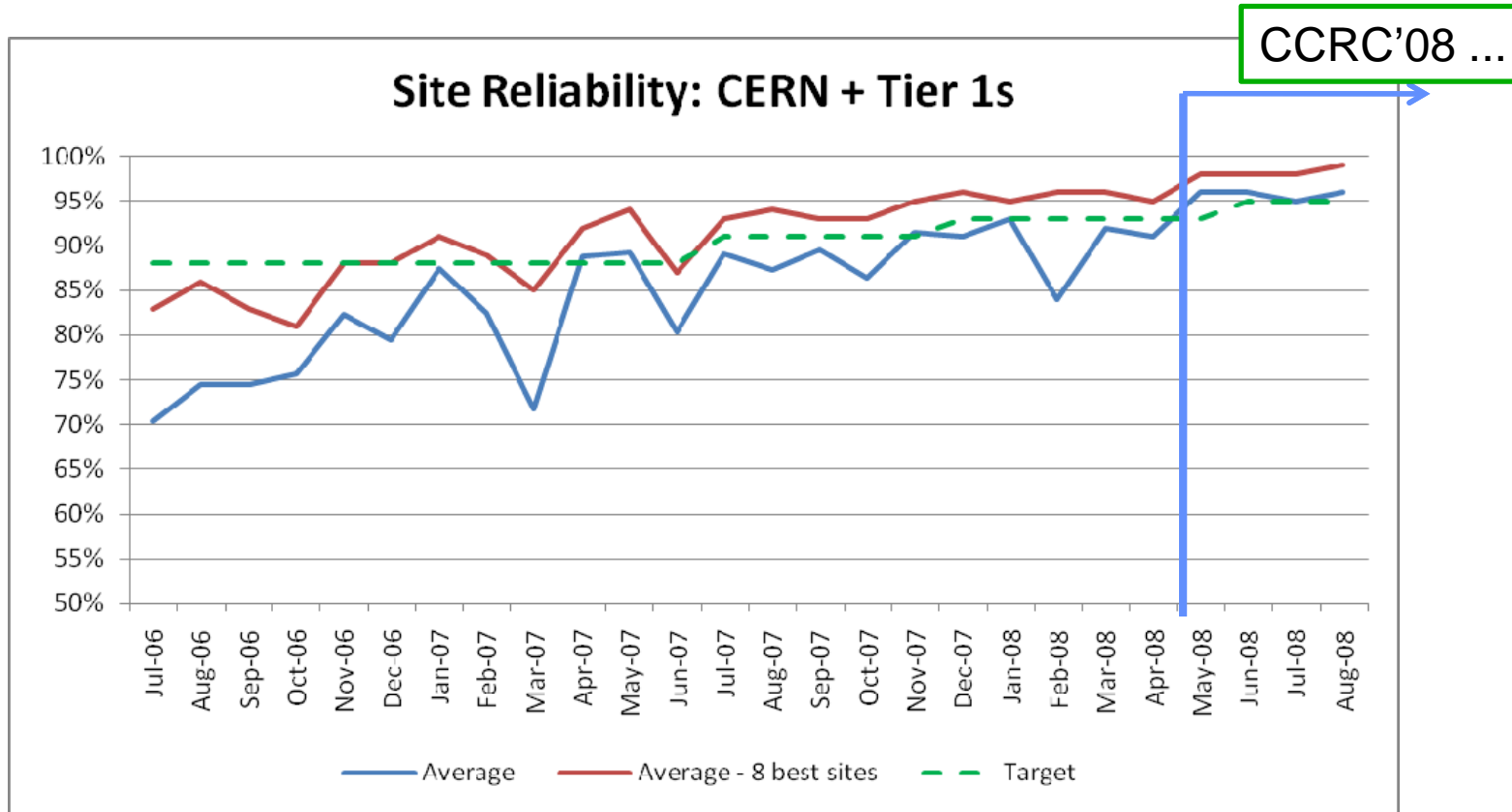
But ... We know that these standard tests hide problems ...
e.g. RAL Castor unavailable for 2 weeks for ATLAS in August
...

VO-specific testing ...

VO-wise Availability and Reliability for WLCG Tier-1s + CERN

Reliability = time_site_is_available / (total_time - time_site_is_scheduled_down)

Availability = time_site_is_available / total_time

Reliability

Site	ALICE	ATLAS	CMS	LHCb	OPS
CA-TRIUMF	N/A	95 %	N/A	N/A	99 %
CERN	99 %	99 %	100 %	30 %	100 %
DE-KIT	100 %	98 %	100 %	68 %	99 %
ES-PIC	N/A	98 %	99 %	52 %	99 %
FR-CCIN2P3	94 %	81 %	99 %	88 %	95 %
IT-INFN-CNAF	100 %	100 %	100 %	80 %	99 %
NDGF	100 %	86 %	N/A	N/A	43 %
NL-T1	99 %	87 %	N/A	0 %	96 %
TW-ASGC	N/A	99 %	98 %	N/A	100 %
UK-T1-RAL	100 %	63 %	97 %	88 %	100 %
US-FNAL-CMS	N/A	N/A	100 %	N/A	99 %
US-T1-BNL	N/A	N/A	N/A	N/A	95 %

>= 95%	>= 85.5%	< 85.5%

Site Reliability: Tier 2s

CCRC'08 ...

Tier 2 Reliabilities
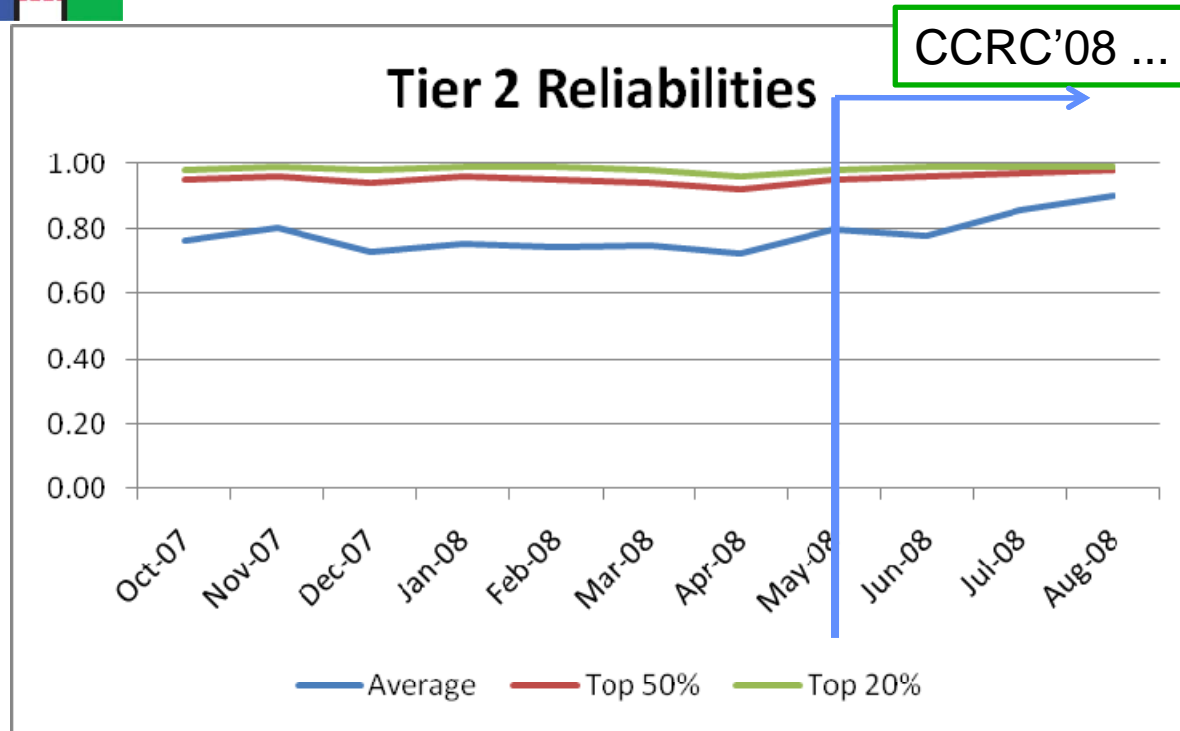
- OSG Tier 2s now reporting regularly – still a few remaining issues to resolve over next couple of months

Middleware: Baseline Services

The *Basic* Baseline Services – from the TDR (2005)

- **Storage Element**
  - **Castor, dCache, DPM**
  - **Storm added in 2007**
  - **SRM 2.2 – deployed in production – Dec 2007**
- **Basic transfer tools – Gridftp, ..**
- **File Transfer Service (FTS)**
- **LCG File Catalog (LFC)**
- **LCG data mgt tools - lcg-utils**
- **Posix I/O –**
  - **Grid File Access Library (GFAL)**
- **Synchronised databases T0←→T1s**
  - **3D project**

- **Information System**
  - **Scalability improvements**
- **Compute Elements**
  - **Globus/Condor-C – improvements to LCG-CE for scale/reliability**
  - **web services (CREAM)**
  - **Support for multi-user pilot jobs (glexec, SCAS)**
- **gLite Workload Management**
  - **in production**
- **VO Management System (VOMS)**
- **VO Boxes**
- **Application software installation**
- **Job Monitoring Tools**

Middleware ... coming

- Since July:
  - Continuing deployment of bug fixes, patches, etc for problems found in prodution
- Clients on new 'platforms'
  - SL5 WN 32/64, SL5 UI 32
  - SL4/SL5 Python 2.5
  - Debian4/32 WN
  - SL4/SL5 + new compiler version
- Imminent or available updates
  - FTS/SL4 (available)
  - Globus bugfixes (available)
  - lcg-CE – further performance improvements
  - Results of WN working group – cluster publishing

New services

- **glexec/SCAS**
  - glexec is being verified for use with experiment frameworks in the PPS (setuid mode, **without SCAS**)
  - SCAS still in 'developer testing'

- **CREAM**
  - First release to production imminent
  - NOT as a replacement for lcg-CE
  - Issues with proxy renewal

- **WMS/ICE**
  - Patch under construction

- **Glue2**
  - OGF Public Comments are now over
  - Glue WG will incorporate these during October
  - Will be deployed in parallel as it is non backward compatible

SL5

- Schedule announce by CERN envisaged SLC5 lxbatch nodes in October
    - "*Formal certification not yet started*"
- Middleware can progress anyway with SL5 or CENTOS5
- We are on course, barring surprises in runtime testing…
- Based on VDT1.8 – hope to upgrade to 1.10 very soon and base the rest of the release on this
- Contemplating an approach to build which would no longer allow co-location of services, apart from explicit exceptions
- Full schedule;
    - Clients
    - VOBOX
    - Storage 32/64
    - CE (NOT LCG-CE)
    - Target - whenever ready but before 6/2009

Milestone Summary

WLCG High Level Milestones - 2007 (9-Sep-08)

Legend: Done (green) | Late < 1 month (orange) | Late > 1 month (red)

ID	Date	Milestone	ASGC	CC IN2P3	CERN	DE-KIT	INFN CNAF	NDGF	PIC	RAL	SARA NIKHEF	TRIUMF	BNL	FNAL
		24x7 Support												
WLCG-07-01	Feb 2007	24x7 Support Definition — Definition of the levels of support and rules to follow, depending on the issue/alarm												
WLCG-07-02	Apr 2007	24x7 Support Tested — Support and operation scenarios tested via realistic alarms and situations				Apr 2008	June 2008							
WLCG-07-03	Jun 2007	24x7 Support in Operations — The sites provides 24x7 support to users as standard operations				July 2008	June 2008		Apr 2008		July 2008			
		VOBoxes Support												
WLCG-07-04	Apr 2007	VOBoxes SLA Defined — Sites propose and agree with the VO the level of support (upgrade, backup, restore, etc) of VOBoxes	Mar 2008	Jul 2008					Mar 2008					
WLCG-07-05	May 2007	VOBoxes SLA Implemented — VOBoxes service implemented at the site according to the SLA	Apr 2008	Jul 2008			Mar 2008	Mar 2008		Apr 2008				
WLCG-07-05b	Jul 2007	VOBoxes Support Accepted by the Experiments — VOBoxes support level agreed by the experiments (ALICE / ATLAS / CMS / LHCb)	ALICE n/a				n/a (ATLAS) / n/a (CMS) / n/a (LHCb)	n/a			n/a	n/a	n/a	n/a
		VOMS Job Priorities												
		VOMS Milestones below suspended until the VOMS Working Group defines new milestones.												
WLCG-07-06b	Jun 2007	New VOMS YAIM Release and Documentation — VOMS release and deployment. Documentation on how to configure VOMS for sites not using YAIM	EGEE-SA1											
WLCG-07-06	Apr 2007	Job Priorities Available at Site — Mapping of the Job priorities on the batch software of the site completed and information published												
WLCG-07-07	Jun 2007	Job Priorities of the VOs Implemented at Site — Configuration and maintenance of the jobs priorities as defined by the VOs. Job Priorities in use by the VOs.												
		Accounting												
WLCG-07-08	Mar 2007	Accounting Data published in the APEL Repository — The site is publishing the accounting data in APEL. Monthly reports extracted from the APEL Repository.												
		MSS Main Storage Systems												
WLCG-07-25	Jun 2007	CASTOR 2.1.3 in Production at CERN — MSS system supporting SRM 2.2 deployed in production at the site			CERN Tier-0									
WLCG-07-26	Nov 2007	SRM: CASTOR 2.1.6 Tested and Accepted by the Experiments at all Sites — From the SRM Roll-Out Plan (SRM-16 to -19)		ALICE n/a		ATLAS Nov 2007		CMS Nov 2007		LHCb Nov 2007				
WLCG-07-27	Nov 2007	SRM: dCache 1.8 Tested and Accepted by the Experiments — From the SRM Roll-Out Plan (SRM-16 to -19)		ALICE n/a		ATLAS Nov 2007		CMS Nov 2007		LHCb Nov 2007				
WLCG-07-30b	May 2008	SRM Missing MoU Features Implemented — With full features agreed in the HEP MoU (srmCopy, etc).		CASTOR		DCache		DPM						
		CAF CERN Analysis Facility												
WLCG-07-40	Oct 2007	Experiment provide the Test Setup for the CAF — Specification of the requirements and setup needed by each Experiment		ALICE		ATLAS May 2008		CMS June 2008		LHCb May 2008				

WLCG High Level Milestones - 2008

ID	Date	Milestone	ASGC	CC IN2P3	CERN	DE-KIT	INFN CNAF	NDGF	PIC	RAL	SARA NIKHEF	TRIUMF	BNL	FNAL
		OSG RSV Tests												
WLCG-08-01	May 2008	RSV Tier-2 CE Tests Equivalent to SAM — Successful WLCG verification of OSG test equivalence of RSV tests to WLCG CE tests		OSG-RSV										
WLCG-08-01b	Jun 2008	RSV Tier-2 SE Tests Equivalent to SAM — Successful WLCG verification of OSG test equivalence of RSV tests to WLCG SE tests		OSG-RSV										
WLCG-08-02	Jun 2008	OSG Tier-2 Reliability Reported — OSG RSV information published in SAM and GOCDB databases. Reliability reports include OSG Tier-2 sites.		OSG-RSV										
		MSS/Tape Metrics												
WLCG-08-03	April 2008	Tape Efficiency Metrics Published — Metrics are collected and published weekly				June 2008								
		Tier-1 Procurement												
WLCG-07-17	1 Apr 2008	MoU 2008 Pledges Installed — To fulfill the agreement that all sites procure they MoU pledged by April of every year	Sept 2008	CPU OK May Disk Sep 08	Apr 2008	Apr 2008	CPU Jul 08 Disk Sept 08	CPU OK May Disk Sep 08	CPU OK May Disk	Apr 2008	Nov 2008	Apr 2008	CPU OK Disk Nov 08	CPU 80% Disk OK May

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(Second table)

ID	Date	Milestone	ASGC	CC IN2P3	CERN	DE-KIT	INFN CNAF	NDGF	PIC	RAL	SARA NIKHEF	TRIUMF	BNL	FNAL
WLCG-08-04	Sep 2008	Sites Report on the Status of the MoU 2009 Procurement — Reporting whether is on track with the MoU pledges by April. Or which is the date when the pledges will be fulfilled.								Tender CPU OK Sep Disk Octobe				
WLCG-08-05	1 Apr 2009	MoU 2009 Pledges Installed — To fulfill the agreement that all sites procure they MoU pledged by April of every year												
		glexec/Pilot Jobs												
WLCG-08-13	May 2008	Glexec and Pilot Jobs Implemented at the Tier-1 Sites	Pilot Jobs Working Group evaluating the Experiments frameworks (10 June 2008)											

Tier-1 Sites Reliability - June 2008

ID	Date	Milestone					
WLCG-08-06	Jun 2008	Tier-1 Sites Reliability above 95% — Considering each Tier-0 and Tier-1 site	Jan 93%		70	92		92	57		91	
			Feb 93%		20	84			84		67	85
			Mar 93%		86		88				80	
			Apr 93%		76	84			90			92
			May 93%		88							
			June 95%		86							93
WLCG-08-07	Jun 2008	Average of Best 8 Sites above 97% — Average of eight sites should reach a reliability above 97%	Averages of the 8 Best sites Jan-Jun 2008: Jan 96 - Feb 96 - Mar 96 - Apr 96 - May 98 - Jun 96					

SAM VO-Specific Tests

WLCG-08-08	Jun 2008	VO-Specific SAM Tests in Place — With results included every month in the Site Availability Reports.	ALICE	ATLAS	CMS	LHCb

Tier-2 Federations Milestones

WLCG-08-09	Jun 2008	Weighted Average Reliability of the Tier-2 Federation above 95% — Average of each Tier-2 Federation weighted according to the sites pledges	See separated table of Tier-2 Federations.
WLCG-08-10	Jun 2008	Installed Capacity above 2008 Pledges of the Tier-2 Federation — Capacity at each Tier-2 Federation vs. the Federation's pledges	See separated table of Tier-2 Federations.

Tier-1 Sites Reliability - Dec 2008

WLCG-08-11	Dec 2008	Tier-1 Sites Reliability above 97% — Considering each Tier-0 and Tier-1 site	Jul 95%		94		79	88		91	
			Aug 95%				43				
			Sept 95%								
			Oct 95%								
			Nov 95%								
			Dec 97%								
WLCG-08-12	Dec 2008	Average of ALL Tier-1 Sites above 98% — The average across ALL Tier-1 sites should reach a reliability above 97%								

The following parameters define the minimum levels of service. They will be reviewed by the operational boards of the WLCG Collaboration.

Service	Maximum delay in responding to operational problems			Average availability* measured on an annual basis	
	Service interruption	Degradation of the capacity of the service by more than 50%	Degradation of the capacity of the service by more than 20%	During accelerator operation	At all other times
Acceptance of data from the Tier-0 Centre during accelerator operation	12 hours	12 hours	24 hours	99%	n/a
Networking service to the Tier-0 Centre during accelerator operation	12 hours	24 hours	48 hours	98%	n/a
Data-intensive analysis services, including networking to Tier-0, Tier-1 Centres outwith accelerator operation	24 hours	48 hours	48 hours	n/a	98%
All other services – prime service hours	2 hour	2 hour	4 hours	98%	98%
All other services – outwith prime service hours	24 hours	48 hours	48 hours	97%	97%

The response times in the above table refer only to the maximum delay before action is taken to repair the problem. The mean time to repair is also a very important factor that is only covered in this table indirectly through the availability targets. All of these parameters will require an adequate level of staffing of the services, including on-call coverage outside of prime shift.

WLCG High Level Milestones - 2007

Done (green) | Late < 1 month (orange) | Late > 1 month (red)

ID	Date	Milestone	ASGC	CC IN2P3	CERN	DE-KIT	INFN CNAF	NDGF	PIC	RAL	SARA NIKHEF	TRIUMF

24x7 Support

WLCG-07-01 | Feb 2007 | 24x7 Support Definition — Definition of the levels of support and rules to follow, depending on the issue/alarm

WLCG-07-02 | Apr 2007 | 24x7 Support Tested — Support and operation scenarios tested via realistic alarms and situations — Apr 2008, June 2008

WLCG-07-03 | Jun 2007 | 24x7 Support in Operations — The sites provides 24x7 support to users as standard operations — July 2008, June 2008, Apr 2008, July 2008

VOBoxes Support

WLCG-07-04 | Apr 2007 | VOBoxes SLA Defined — Sites propose and support (upgrade… — Mar 2008, Mar 2008

WLCG-07-05 | May 2007 | VOBoxes SLA In… VOBoxes service… the SLA — Mar 2008, Apr 2008

WLCG-07-05b | Jul 2007 | VOBoxes Suppo… Experiments — VOBoxes support… experiments — n/a n/a n/a n/a n/a

VOMS Job Priorities

VOMS Milestones below suspended until the VOMS Working Group defines new milestones.

WLCG-07-06b | Jun 2007 | New VOMS YAIM Release and Documentation — VOMS release and… configure VOMS for… — EGEE-SA1

WLCG-07-06 | Apr 2007 | Job Priorities Avai… Mapping of the Job… completed and infor…

WLCG-07-07 | Jun 2007 | Job Priorities of th… Configuration and r… defined by the VOs…

Accounting

WLCG-07-08 | Mar 2007 | Accounting Data… The site is publishing the accounting data in APEL. Monthly reports extracted from the APEL Repository.

WLCG-07-2…

WLCG-07-2… | | ATLAS Nov 2007 | CMS Nov 2007 | LHCb Nov 2007

WLCG-07-2… | | ATLAS Nov 2007 | CMS Nov 2007 | LHCb Nov 2007

WLCG-07-30b | 2008 | With full features agreed in the HEP MoU (srmCopy… | CASTOR | DCache | DPM

WLCG-07-4… | | ATLAS May 2008 | CMS June 2008 | LHCb May 2008

WLCG High Level Milestones - 2008

OSG RSV Tests

WLCG-08-01 | May 2008 | RSV Tier-2 CE Tests Equivalent to SAM — Successful WLCG verification of OSG test equivalence of RSV tests to WLCG CE tests — OSG-RSV

WLCG-08-01b | Jun 2008 | RSV Tier-2 SE Tests Equivalent to SAM — Successful WLCG verification of OSG test equivalence of RSV tests to WLCG SE tests — OSG-RSV

WLCG-08-02 | Jun 2008 | OSG Tier-2 Reliability Reported — OSG RSV information published in SAM and GOCDB databases. Reliability reports include OSG Tier-2 sites. — OSG-RSV

MSS/Tape Metrics

WLCG-08-03 | April 2008 | Tape Efficiency Metrics Published — Metrics are collected and published weekly — June 2008

Tier-1 Procurement

WLCG-07-17 | 1 Apr 2008 | MoU 2008 Pledges Installed — To fulfill the agreement that all sites procure they MoU pledged by April of every year — Sept 2008 | CPU OK May Disk Sep 08 | Apr 2008 | Apr 2008 | CPU Jul 08 Disk Sept 08 | CPU OK May Disk Sep 08 | CPU OK May Disk | Apr 2008 | Nov 2008 | Apr 2008 | CPU OK Disk Nov 08 | CPU 80% Disk OK May

Procurements:
2008: see status in Tier 1 talk
2009: reporting status this month

glexec/Pilot Jobs

WLCG-08-13 | May 2008 | Glexec and Pilot Jobs Implemented at the Tier-1 Sites — Pilot Jobs Working Group evaluating the Experiments frameworks (10 June 2008)

WLCG-08-06 | Jun 2008 | …

WLCG-08-07 | Jun 2008 | Aver… Aver… 97% — Jan 96 - Feb 96 - Mar 96 - Apr 96 - May 98 - Jun 96

Tender CPU OK Sep Disk Octobe — 85 / 92 / 93

CMS | LHCb

Average of each Tier-2 Federation weighted according to the sites pledges — See separated table of Tier-2 Federations.

WLCG-08-10 | Jun 2008 | Installed Capacity above 2008 Pledges of the Tier-2 Federation — Capacity at each Tier-2 Federation vs. the Federation's pledges — See separated table of Tier-2 Federations.

Tier-1 Sites Reliability - Dec 2008

WLCG-08-11 | Dec 2008 | Tier-1 Sites Reliability above 97% — Considering each Tier-0 and Tier-1 site

Jul 95%	94		79	88	91
Aug 95%			43		
Sept 95%					
Oct 95%					
Nov 95%					
Dec 97%					

WLCG-08-12 | Dec 2008 | Average of ALL Tier-1 Sites above 98% — The average across ALL Tier-1 sites should reach a reliability above 97%

Callout boxes:

- VO Box SLAs: In use, generally being finalised and signed off
- In test by ATLAS – waiting for confirmation to deploy more widely
- Agreed specific functionality – end of 2008
- CAF : defined during CCRC
- OSG Reliability reporting in place
- Tape metrics: ASGC will duplicate CERN metrics; IN2P3 have some metrics from HPSS but reporting not yet automated
- Glexec (for pilot jobs): glexec and experiment frameworks OK Waiting for SCAS to be available
- VO-specific availability testing: validation in progress

Milestone Summary

Concerns etc.

- **Operational instabilities**
  - Especially of storage systems
  - Staffing MSS installations at sites adequate?

- **Resources:**
  - Sharing of allocations – need guidelines
  - Extended delays for 2008 resources; hope 2009 is better (but still will be vulnerable to delays/problems)
  - Overall planning/pledging process is probably unrealistic and we need to adjust it – C-RRB topic
    - 5year outlook → 3 years?
    - RSG should be looking +1 year in advance
    - Confirmed pledges/RRB needs to be earlier in the cycle

- **User analysis at CERN**
  - But NB strategy is that Tier 2s are for analysis
    - Setting this up is late (no clear idea of what was needed; previous delays in Castor)