



LHC Computing Grid

Status of Resources and Financial Plan

Sue Foffano

IT Department, CERN

15th April 2008

www.cern.ch/lcg





Agenda

- Conclusions and key messages from Autumn C-RRB meeting
- Progress in signing the WLCG MoU
- Funding and expenditure for WLCG at CERN
 - 2005-2008
 - 2009-2012
- Resource usage accounting
 - for external Tier-1s and CERN
 - for Tier-2s
- Computing Resource Pledge Responsibilities
- A summary of the revised computing capacity pledges
- Conclusions and key messages

Supporting information can be found in:

- Written report (CERN-RRB-2008-039)
- LCG planning web pages: <http://lcg.web.cern.ch/LCG>
(Project Planning)





Conclusions and Key Messages from Autumn C-RRB meeting

- ☺ MoU: The signing of the 2 remaining NDGF countries (Norway and Sweden), Austria, Germany (LMU and ALU) are expected very soon.
- ☺ Conclusion and signing of the MoU for the additional announced T2 centres before the next C-RRB meeting.
 - MoU pledge levels for 2007 must be fully honored and for 2008 installed and in production by April 2008 to ensure sufficient time for full-scale testing.
- ☺ Tier-2 Federations must ensure that their sites are identified and reporting data for accounting purposes, and their pledge level is reached.
 - Tier-1 and Tier-2 Federations **MUST** confirm their 2008 pledges and provide pledge values from 2009-2012 (deadline extended).





Signing the WLCG MoU (1)

- Since the October 2007 C-RRB the following federations have signed:
 - Finland (T1 + T2)
 - Germany: LMU and ALU (T2)
 - Norway (T1 + T2)
 - Sweden (T1 + T2)
 - Estonia (T2)
 - Hungary (T2)
 - Republic of Korea (T2)
 - Turkey (T2)
- Of the 11 Tier-1 Centres, all have now signed including the Nordic Data Grid Facility (NDGF) following the signatures of Finland, Norway and Sweden, Denmark having already signed.





Signing the WLCG MoU (2)

- Signatures are still outstanding for the following Tier-2s:
 - Austria - waiting Finance Ministry approval (05/03/08)
 - Czech Republic (planned to be signed on 15/04/08)
- The following centres are planning to join the WLCG collaboration.

Tier-2 Centres	ALICE	ATLAS	CMS	LHCb
Brazil CBPF, UERJ, UFRJ, UNESP	X	X	X	X
Canada East		X		
Canada West		X		

} Planning to sign
before 15/04/08





LCG Budget Estimates in MCHF 2005-2008 at 29/02/08

	2005	2006	2007	2008	TOTAL
Funding					
- Personnel	1.5	19.8	21.1	20.4	62.9
- Materials	1.8	21.3	18.6	27.6	69.3
Total Funding	3.3	41.1	39.7	48.0	132.2
Expenditure					
- <u>Personnel</u> **	1.5	19.8	21.1	20.1	62.5
- <u>Materials</u>	1.8	21.3	18.6	26.7	68.4
- <i>Physics Operations</i>		5.0	5.1	5.0	15.1
- <i>Tier 0 and CERN Analysis Facility</i>	1.8	16.3	13.5	21.8	53.3
Total Planned Expenditure	3.3	41.1	39.7	46.8	130.9
Balance Personnel	0.0	0.0	0.0	0.4	0.4
Balance Materials	0.0	0.0	0.0	0.9	0.9
Balance	0.0	0.0	0.0	1.3	1.3





LCG Budget Estimates in MCHF 2009-2012 at 29/02/08

	2009	2010	2011	2012	TOTAL
Funding					
- Personnel	15.1	15.6	13.9	13.8	58.4
- Materials	23.4	22.5	22.5	22.5	91.0
Total Funding	38.5	38.1	36.4	36.3	149.3
Expenditure					
- Personnel **	15.6	15.7	14.2	13.4	58.9
- Materials	23.0	21.5	23.4	22.1	89.9
Total Planned Expenditure	38.5	37.2	37.6	35.5	148.8
Balance Personnel	-0.5	-0.1	-0.3	0.4	-0.5
Balance Materials	0.5	1.1	-0.9	0.4	1.1
Balance	0.0	1.0	-1.2	0.8	0.6





LCG Budget Estimates at CERN 2005-2012

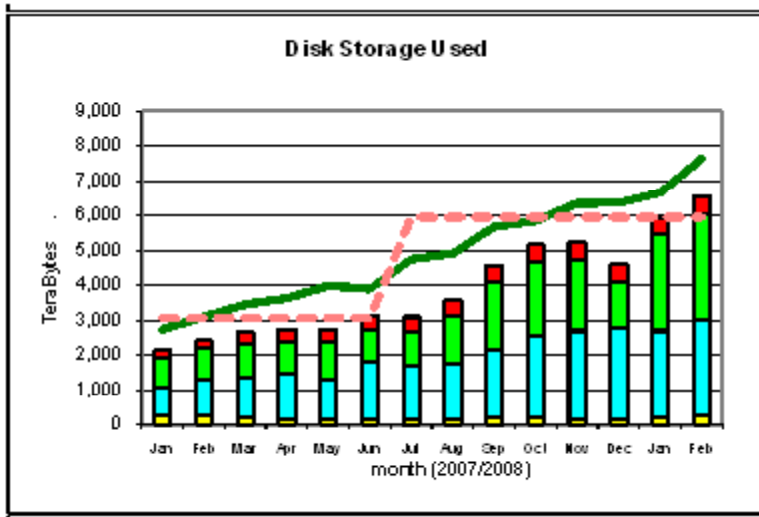
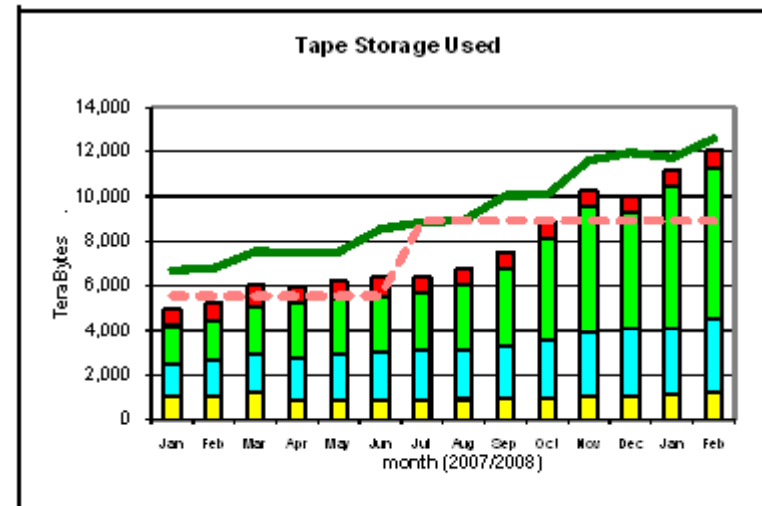
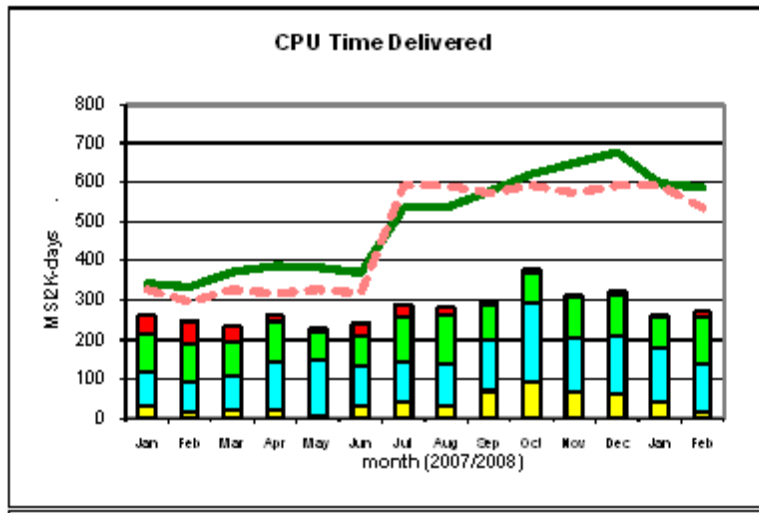
- Slides 6 & 7 show CERN funding and planned expenditure for 2005-2008 and 2009-2012 of the LCG project at CERN in MCHF.
- The successor project to EGEE2, EGEE3 was recently approved confirming continued personnel (14 FTE) working on Grid Deployment activities.
- EGEE2 was extended by 1 month to end April 2008.
- EGEE3 will run from May 2008 to end April 2010.
- The future estimated materials expenditure includes:
 - Procurements to satisfy the requirements data from the experiments up to 2012
 - an allowance for adapting the CERN infrastructure to the increased power and cooling requirements





Tier-1 CPU, Disk and Tape

January 2007-February 2008



ALICE ATLAS LHCb CMS
 installed capacity (inc. efficiency factor)
 MoU commitment (inc. efficiency factor)





Accounting for Tier-1s and CERN

- The graphs on slide 9 show a summary of CPU, Disk and Tape Storage accounting for 2007, January & February 2008 for Tier-1s and CERN.
- How to interpret the graphs:
 - green line indicates installed capacity
 - pink dotted line indicates the pledged capacities
 - bars show the usage of the resource, colour-coded for each of the four experiments
- Installed capacity already exceeds the 2007 MoU pledge level.
- 2008 MoU pledge levels will be used from April 2008 onwards.
- Most Tier-1s will have their CPU pledges in place for May 2008, whereas disk and tape pledges will only be available later in the year - delays mainly due to procurement timescale, late delivery or delivery of faulty equipment.





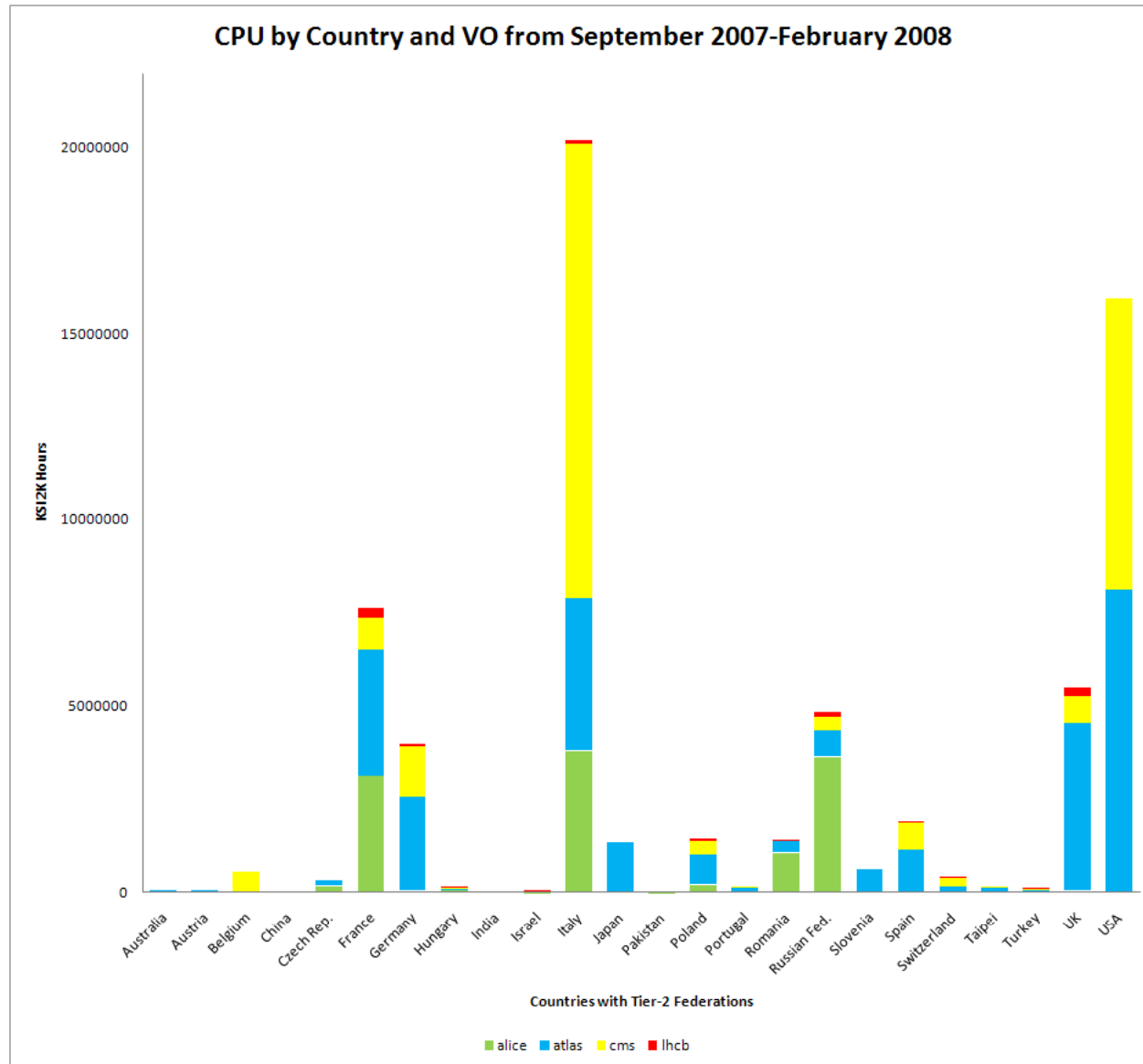
Accounting for Tier-2s (1)

- Test reporting took place in summer 2007 and formal reporting started from September 2007.
- Monthly reports are now produced, circulated for comment and published on the LCG Project Planning website.
- Currently the 52 of the 57 Federations are reporting accounting data over a total of 107 sites:
 - Changes still being signaled for site names therefore situation not yet fully stable
 - Some Federations provided pledge information from 2008 onwards and will be included in the reporting from April
 - Follow-up required with Finland, India, Norway, Sweden and Ukraine to include them in the accounting reporting
- Slide 12 shows the global picture of reporting by country from September 2007-February 2008.
- Slides 13 and 14 show the comparison of MoU pledge with CPU provided split according to size of pledge.



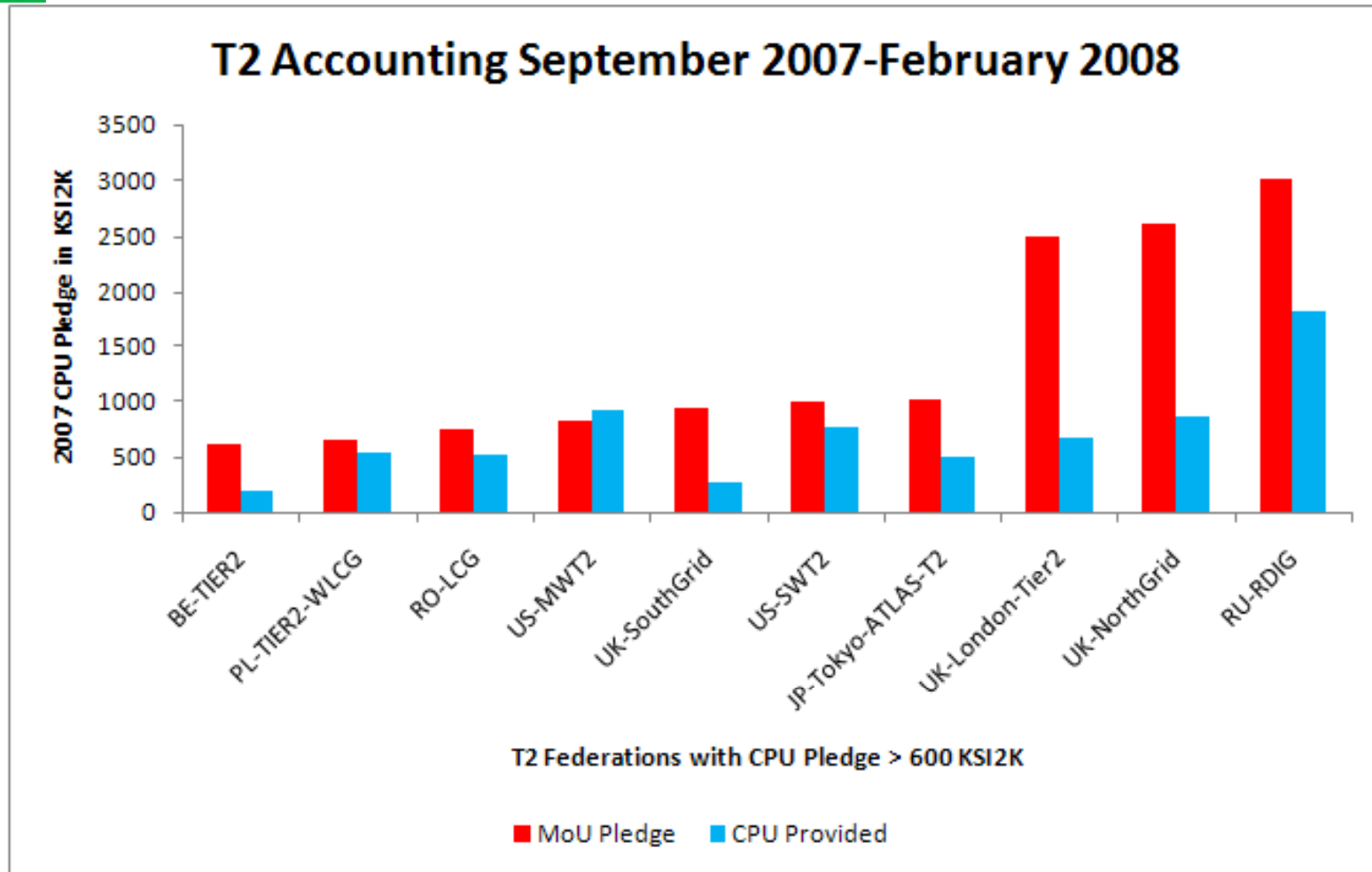


Accounting for Tier-2s (2)



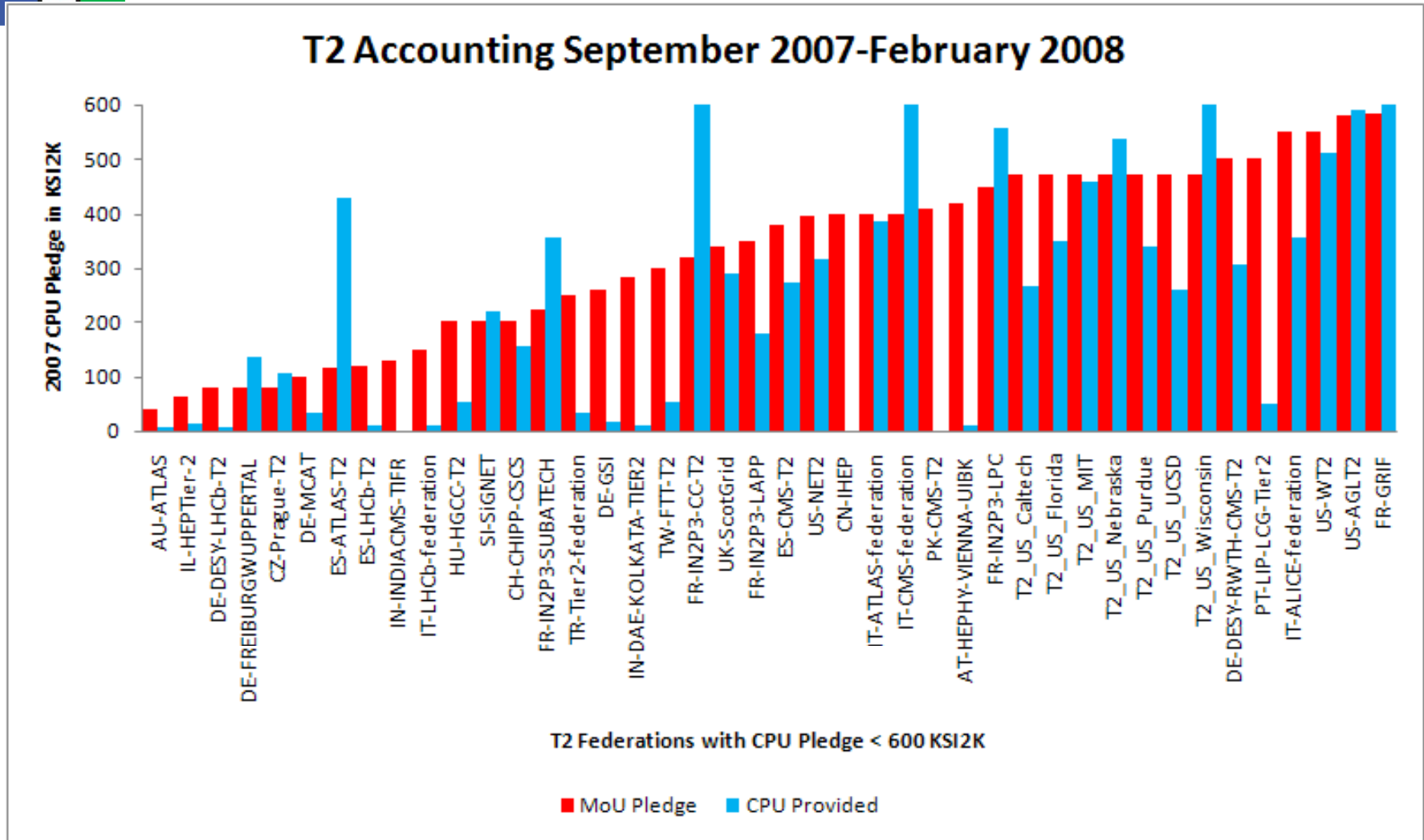


Accounting for Tier-2s (3)





Accounting for Tier-2s (4)





Computing Resource Pledge Responsibilities

- Following the pledge revision exercise of Autumn 2007 a reminder of the process is felt necessary.
- Autumn C-RRB meeting each Federation is expected to provide:
 - Firm commitment to pledge values for the following year
 - Planned pledge values for the subsequent 4 years
- Spring C-RRB meeting each Federation is expected to:
 - Confirm that pledge values for the current year are installed and running a production service, or explain any problems for the current year or changes for future years
- 2 weeks before the next C-RRB on 11/11/08 the following is therefore required:
 - Confirmed 2009 pledge values (confirmation of already communicated value, or revised upwards)
 - Planned pledge values 2010-2013 inclusive (confirmation or revision of already communicated values, + 2013)





Pledge Balance in 2008

- The table below shows the status for 2008 from the responses received from the Tier-1 and Tier-2 sites.
- This is the status as of 26/03/08 and includes
 - Pledge values for Federations having recently joined WLCG
 - Revisions received after the Autumn C-RRB meeting
- % indicates the balance between offered and required.

	ALICE	ATLAS	CMS	LHCb	Sum 2008
T1 CPU	-45%	6%	7%	43%	-5%
T1 Disk	-40%	2%	-23%	33%	-12%
T1 Tape	-49%	-5%	-4%	39%	-13%
T2 CPU	-46%	0%	27%	-7%	-3%
T2 Disk	-20%	-19%	-16%	-	-15%





Pledge Balance 2008-2012

The table below shows the global picture for 2008-2012, status as of 26/03/08.

- % indicates the balance between offered and required.
- The 2008 resource situation is reasonably well understood for the level of activity anticipated.
- It becomes urgent to improve the 2009 resource balance - to be reviewed at the next C-RRB meeting following the pledge revision exercise.
- Globally there is still major shortfall - also to be reviewed at the Autumn C-RRB following revision.

	Sum 2008	Sum 2009	Sum 2010	Sum 2011	Sum 2012
T1 CPU	-5%	-11%	-11%	-17%	-24%
T1 Disk	-12%	-12%	-15%	-17%	-24%
T1 Tape	-13%	-13%	-17%	-22%	-29%
T2 CPU	-3%	-14%	-34%	-37%	-43%
T2 Disk	-15%	-4%	-1%	-11%	-21%





Conclusions

- MoU: The signatures are now well advanced with just Austria and Brazil needing follow-up.
- WLCG Funding & Expenditure: the global situation up to and including 2012 suggests that the project will not run into major financial difficulties.
- Tier-1 and Tier-2 accounting reporting: mainly positive evolution. Remaining Tier-2 Federations not yet reporting must start to enable a more complete picture for next C-RRB meeting to be presented.
- Pledge Balance: still showing significant shortfall. To be reviewed at the next C-RRB meeting following the pledge revision exercise
- Pledge Revision: needed from all Federations to confirm 2009 pledges and communicate 2010-2013 pledges
 - Deadline for communication : **27/10/08**
 - Date of next C-RRB meeting : **11/11/08**

