

1. Introduction

The following report summarises

- Current signature status of the Worldwide LHC Computing Grid (WLCG) Memorandum of Understanding (MoU) and Tier definition
- Funding and expenditure status for WLCG at CERN
- Resource accounting for Tier0,1 and 2 sites
- Status of experiment requirements and resource pledges

Complementary information can be found on the WLCG website <http://lcg.web.cern.ch/LCG/>

2. WLCG Memorandum of Understanding Signature Status

Following the announcement of imminent MoU signatures at the last C-RRB meeting, 2 further signatures were obtained: Greece as a CMS Tier2 and US LBNL as an ALICE Tier2. In addition US LLNL has been granted full member access as an ALICE Tier2, initially based on a letter of intent from the institute to CERN's Director of Research and Scientific Computing due to legal constraints preventing MoU signature. These constraints are being followed up to enable the MoU to be signed as soon as possible – progress will be reported on at the next meeting.

Within the LCG-France infrastructure a former Tier3, LPSC Grenoble, became a new Tier2 serving both ALICE and ATLAS.

Expressions of interest from other countries or existing collaborators to change their tier status are also being examined and followed up on. Progress will be reported at the next meeting.

Tables 1 and 2 contain the official definition of the Tier1 and Tier2s as reflected in the MoU annex 1 & 2. Any changes should continue to be signalled to lcg.office@cern.ch to ensure that the MoU information available at <http://lcg.web.cern.ch/LCG/mou.htm> is constantly maintained up to date and accurate.

Tier0 and the CERN Analysis Facility

<i>Experiments served with priority</i>				<i>Representative to WLCG Collaboration</i>
<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>	
X	X	X	X	F. Hemmer

Tier1

<i>Centre</i>	<i>Experiments served with priority</i>				<i>Representative to WLCG Collaboration</i>	<i>Funding Agencies</i>
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>		
Canada, TRIUMF		X			M. Vetterli	CFI
France, CC-IN2P3	X	X	X	X	F. Malek (deputy: F. Chollet)	CNRS/IN2P3 and CEA/DSM/IRFU
Germany, KIT	X	X	X	X	W. Juling (deputy: A. Streit)	BMBF/KIT
Italy, CNAF	X	X	X	X	M. Morandin (deputy: L. Dell'Agnello)	INFN
Netherlands LHC/Tier1	X	X		X	J. Templon	NIKHEF
Nordic Data Grid Facility (NDGF)	X	X	¹		L. Fischer	NSRC/HIP/RCN/SRC
Spain, PIC		X	X	X	M. Delfino (deputy: G. Merino)	MEC
Taipei, ASGC		X	X		S. Lin	Academia Sinica
UK, RAL	X	X	X	X	N. Geddes	STFC
USA, BNL		X			M. Ernst (alt.: J. Hover)	DOE
USA, FNAL			X		V. White	DOE

¹ NDGF serves as a CMS Tier-2 resource

Table 1: Tier0 and Tier1 sites as defined in Annex 1 of the WLCG MoU
(last updated 12th April 2011)

Tier2

<i>Institution</i>	<i>Experiments served with priority</i>				<i>Representative to WLCG Collaboration</i>	<i>Funding Agencies</i>
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>		
Austria, Austrian Tier-2 Federation - Institute for High Energy Physics, Vienna - University of Innsbruck		X	X		Alternates: D. Liko D. Kuhn	BMWF
Australia, University of Melbourne		X			G. Taylor, L. Boland	AusHEP
Brazil, SPRACE, São Paulo			X		S. F. Novaes, Unesp (alt: E. de M. Gregores)	FAPESP
Belgium, Belgian Tier-2 Federation - UA, Antwerpen - UCL, Louvain-la-Neuve - ULB, Brussels - UMH, Mons - VUB, Brussels - UGent, Gent			X		Alternates: G. Bruno, UCL P. Vanlaer, ULB O. Devroede, VUB	FNRS (UCL, ULB, UMH) and FWO (UA, VUB, UGent)
Canada, Canada-East Federation - University of Toronto		X			P. Savard (alt.: S. Robertson)	CFI

<i>Institution</i>	<i>Experiments served with priority</i>				<i>Representative to WLCG Collaboration</i>	<i>Funding Agencies</i>
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>		
Canada, Canada-West Federation - University of Alberta - Simon Fraser University - University of Victoria		X			M. Vetterli (alt.: R. Sobie)	CFI
China, IHEP, Beijing		X	X		Gang Chen	MoST NSFC
Czech Rep., FZU AS, Prague	X	X			M. Lokajicek	MSMT CR
Estonia, NICPB			X		M. Kadastik	Estonian Ministry of Education and Research
Finland, NDGF/HIP Tier2			X		D.O. Riska	HIP
France, CC-IN2P3 AF	X	X	X	X	F. Malek (deputy: F. Chollet)	CNRS/IN2P3 and CEA/DSM/IRFU
France, CPPM, Marseille		X		X	F. Touchard	CNRS/IN2P3
France, GRIF, Paris - IRFU, Saclay - IPN, Orsay - LAL, Orsay - LLR, Plaiseau - LPNHE, Paris	X	X	X	X	J.P. Meyer	CNRS/IN2P3 and CEA/DSM/IRFU
France, IPHC, Strasbourg	X		X		D. Bloch	CNRS/IN2P3
France, LAPP, Annecy		X		X	S. Jézéquel	CNRS/IN2P3
France, LPC, Clermont-Ferrand	X	X		X	D. Pallin	CNRS/IN2P3
France, LPSC, Grenoble	X	X			S. Crépe-Renaudin	CNRS/IN2P3
France, SUBATECH, Nantes	X				L. Aphecetche	CNRS/IN2P3
Germany, GSI, Darmstadt	X				P. Malzacher	BMBF/GSI
Germany, ATLAS Federation FR/W - Albert-Ludwigs-Universität, Freiburg - Bergische Universität, Wuppertal		X			Alternates: J. E. Sundermann T. Harenberg	ALU/BUW/DESY
Germany, ATLAS Federation, Munich - MPI für Physik - Ludwig Maximilian Universität - Leibniz Rechenzentrum - Rechenzentrum Garching der MPG		X			S. Bethke	LMU/LRZ/MPG
Germany, ATLAS Federation, HH/Goe - DESY - University of Goettingen		X			V. Gülzow (alternate: A. Quadt - Univ.Goettingen)	BMBF/DESY/UGOE
Germany, CMS Federation - DESY - RWTH, Aachen			X		V. Gülzow (alternate: T. Kress - RWTH Aachen)	BMBF/DESY/RWTH
Germany, LHCb Federation, DESY				X	V. Gülzow	BMBF/DESY
Greece, High Energy Physics Laboratory, University of Ioannina			X		I. Papadopoulos	University of Ioannina
Hungary, HGCC Federation - KFKI-RMKI, Budapest - SzTAKI, Budapest - ELUB, Budapest - DU, Debrecen	X		X		Alternates: G. Vesztergombi D. Horvath C. Hajdu	NKTH
India, TIFR, Mumbai			X		K. Mazumdar	DAE
India, VECC/SINP, Kolkata	X				Y.P. Viyogi	DAE
Israel, HEP-IL Tier-2 Federation		X			L. Levinson	ICHEP
Italy, INFN ALICE Federation	X				M. Masera	INFN
Italy, INFN ATLAS Federation		X			G. Carlino (deputy: A. De Salvo)	INFN
Italy, INFN CMS Federation			X		M. Paganoni	INFN

<i>Institution</i>	<i>Experiments served with priority</i>				<i>Representative to WLCG Collaboration</i>	<i>Funding Agencies</i>
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>		
Italy, INFN LHCb Federation				X	U. Marconi	INFN
Japan, ICEPP, Tokyo		X			H. Sakamoto	University of Tokyo
Republic of Korea, KISTI, Daejeon	X				S. Hwang	KICOS
Republic of Korea, CHEP of KNU, Daegu			X		D. Son G. N. Kim	KICOS
Norway, UNINETT SIGMA Tier-2		X			J. Koster	RCN
Pakistan, Pakistan Tier-2 Federation - NCP - PAEC			X		H. Hoorani	PAEC/NCP
Poland, Polish Tier-2 Federation - Krakow - Poznan - Warszawa	X	X	X	X	M. Gorski	The Minister of Science & Higher Education
Portugal, LIP Tier-2 Federation - LIP, Lisbon - LIP, Coimbra		X	X		J. Gomes, Lisboa (deputy: M. David)	GRICES/FCT/UMIC
Romania, Romanian Tier-2 Federation - NIPNE - PUB - ISS - UAIC - ITIM	X	X		X	M. Dulea, NIPNE	National Authority for Scientific Research
Russian Fed., Russian Data-Intensive GRID (RDIG) ²	X	X	X	X	V. Ilyin (alt.: V. Korenkov)	Federal Agency for Science and Innovation/JINR
Slovenia, SiNET, Jozef Stefan Institute		X			B. Kersevan	Ministry of Higher Education, Science and Technology
Spain, ATLAS Federation - IFAE, Barcelona - IFIC, Valencia - UAM, Madrid		X			J. Salt (alt: A. Pacheco Pages, J. del Peso)	MEC
Spain, CMS Federation - CIEMAT, Madrid - IFCA, Santander			X		F. Matorras (alt.: N. Colino)	MEC
Spain, LHCb Federation - UB, Barcelona - USC, Santiago				X	R. Graziani Diaz (alt.: J.J. Saborido Silva)	MEC
Sweden, SNIC Tier-2	X	X			S. Holmgren	VR
Switzerland, CHIPP		X	X	X	C. Grab	SER/SNF/ETH/CSCS
Taipei, Taiwan Analysis Facility Federation - Academia Sinica - National Taiwan University - National Central University		X	X		S. Lin	Academia Sinica
Turkey, Turkish Tier-2 Federation - TAEK - ULAKBIM		X	X		Alternates: I. Turk Cakir (TAEK) L. Baskus (TAEK) B. Ortakaya (ULAKBIM)	Turkish Atomic Energy Authority (TAEK)
UK, London Tier 2 - Brunel - ICL - QMUL - RHUL - UCL		X	X	X	D. Colling, ICL	STFC

² The Russian (distributed/advanced) Tier2 Cluster

<i>Institution</i>	<i>Experiments served with priority</i>				<i>Representative to WLCG Collaboration</i>	<i>Funding Agencies</i>
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>		
UK, NorthGrid - Daresbury Lab. - Lancaster - Liverpool - Manchester - Sheffield		X		X	R. Jones, Lancaster	STFC
UK, ScotGrid - Durham - Edinburgh - Glasgow		X		X	P. Clark (Edinburgh)	STFC
UK, SouthGrid - Birmingham - Bristol - Cambridge - Oxford - RAL - Sussex - Swansea - Warwick	X	X	X	X	P. Watkins, Birmingham	STFC
Ukraine, Ukrainian Tier-2 Federation - Kiev - BITP, KNU, KPI - Kharkov – ISMA, KhIPT	X		X		G. Zinovjev, Kiev	National Academy of Sciences
USA, LBNL ALICE, Berkeley CA	X				J. Porter	DOE/NP
USA, LLNL ALICE, Livermore CA	X				R. Soltz	DOE/NP
USA, Great Lakes ATLAS T2 -University of Michigan -Michigan State University		X			S. McKee (alt.: B. Ball)	NSF
USA, Northeast ATLAS T2 - Boston Univ. - Harvard Univ.		X			J. Shank, BU (alt.: S. Youssef)	NSF
USA, Midwest ATLAS T2 - University of Chicago - Indiana University		X			R. Gardner, U. Chicago (alt.: F. Luehring)	NSF
USA, Southwest ATLAS T2 - Langston University - Univ. of New Mexico - Oklahoma University - University of Texas, Arlington		X			K. De, UTA (alt.: H. Severini)	NSF
USA, SLAC ATLAS T2		X			W. Yang (alt.: R. Mount)	NSF
USA, Caltech CMS T2			X		H. Newman, Caltech (alt.: J. Bunn)	NSF
USA, Florida CMS T2			X		P. Avery, U. Florida (atl.: R. Cavanaugh)	NSF
USA, MIT CMS T2			X		C. Paus, MIT	NSF
USA, Nebraska CMS T2			X		K. Bloom, U. Nebraska (alt.: D. Swanson)	NSF
USA, Purdue CMS T2			X		N. Neumeister, U. Purdue	NSF
USA, UC San Diego CMS T2			X		F. Wuerthwein, UCSD (alt.: J. Branson)	NSF
USA, U. Wisconsin CMS T2			X		S. Dasu, U. Wisconsin (alt.: W. Smith)	NSF

Table 2: Tier2 sites as defined in Annex 2 of the WLCG MoU
(last updated 10th October 2011)

3. Funding and Expenditure for WLCG at CERN

As announced at the last meeting and following the book-closing exercise, 5.9 MCHF was carried over from 2010 to 2011 for the project. Table 3 shows current and future estimated expenditure for the years 2011-2016 inclusive based on CERN's Medium Term Plan and the current WLCG Personnel and Material planning.

LHC Future Computing Funding and Expenditure Estimates (all figures in MCHF)							
	2011	2012	2013	2014	2015	2016	TOTAL
Funding							
From CERN Budget							
- Personnel	14.7	16.3	16.6	16.9	16.9	17.0	98.4
- Materials *	27.8	20.3	23.0	23.0	20.8	20.8	135.8
Contributions via Team Accounts**							
- Personnel	1.2	0.7					1.9
- Materials							
Total							
- Personnel	15.9	17.0	16.6	16.9	16.9	17.0	100.3
- Materials	27.8	20.3	23.0	23.0	20.8	20.8	135.8
Total Funding	43.7	37.4	39.6	39.9	37.7	37.8	236.1
Expenditure							
- Personnel ***	16.2	17.0	16.6	16.8	16.9	17.0	100.4
- Materials	22.4	29.4	22.1	24.2	24.2	24.1	146.3
Total Planned Expenditure	38.6	46.4	38.7	41.1	41.0	41.1	246.8
Balance Personnel	-0.3	0.0	0.0	0.1	0.0	0.0	-0.1
Balance Materials	5.5	-9.0	0.9	-1.3	-3.3	-3.3	-10.6
Balance	5.1	-9.0	0.9	-1.2	-3.3	-3.2	-10.7
<small>* Includes 5.9 MCHF carry-forward from 2010 to 2011 ** As planned to be pledged in the WLCG MoU (Annex 6.6) *** Excluding EGI/EMI funded personnel and Computer Centre Operators</small>							

Table 3: LHC Computing budget estimates for 2011-2016

For personnel costs, nominative details continue to be entered in CERN's planning tool APT including current personnel commitments, planned replacements and estimates for on-going recruitment impacting 2012 and beyond. With respect to the budget there is very little discrepancy and factors such as internal mobility, resignations and later than expected start dates can impact these figures at any time.

Materials estimated expenditure shows more significant discrepancy with respect to the budget. Expenditure is based on the current LCG Resource planning which is based on provisional requirements information obtained from the experiments not yet validated by official bodies (LHCC, RSG), and the latest LHC accelerator schedule. The Tier0 strategy and cost planning

remains approximate until the tender for the remote centre has been adjudicated in 2012 after which the cost planning implications can be finalised. The materials expenditure plan for 2012 exceeds the expected budget significantly therefore the planned carry-over from 2011 to 2012, which is estimated to be similar to that of last year, will help to boost the budget. Despite this a materials budget deficit may occur in 2012 due to the Computer Centre upgrade, large scale machine replacement in the 4th rather than 3rd year and additional disk and tape purchases.

4. Resource Accounting

4.1 CERN and External Tier1 Accounting

Accounting data for CERN and External Tier1 sites has continued to be reported to the C-RRB and Overview Board meetings, and full accounting reports from 2006 are available on the LCG Document Repository Accounting page.

Rather than present the usual global accounting view for CERN and the Tier1s, Figure 1 illustrates the CPU time delivered, Disk and Tape storage used at CERN for the period January to August 2011 inclusive, including the change from 2010 to 2011 pledges in April 2011, and Figure 2 shows the accounting reports from each of the Tier1s for the same period.

Tier0-CERN

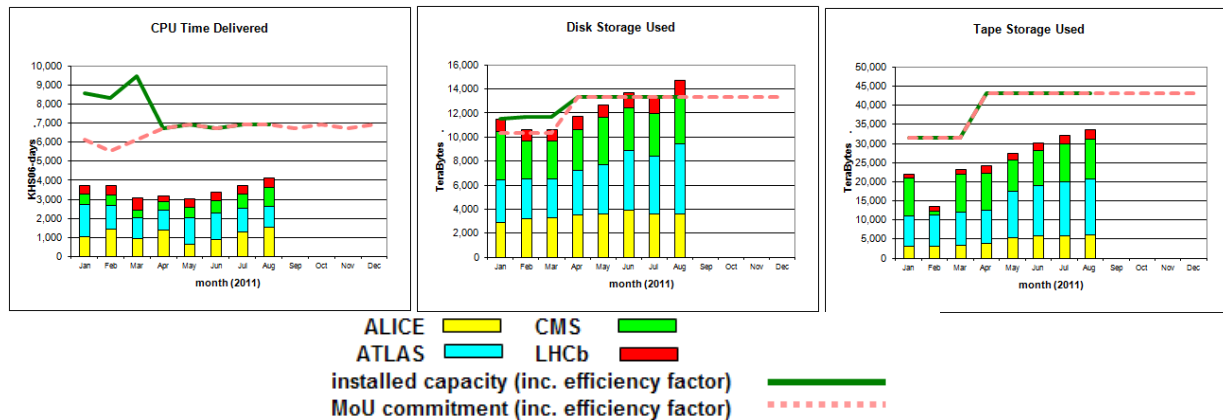
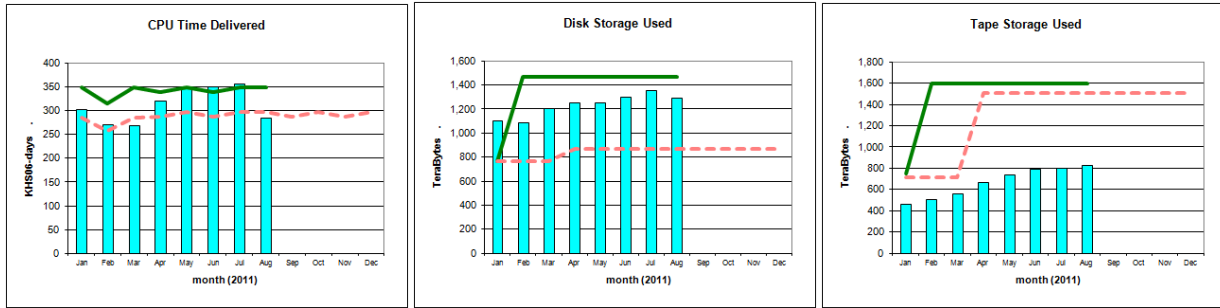
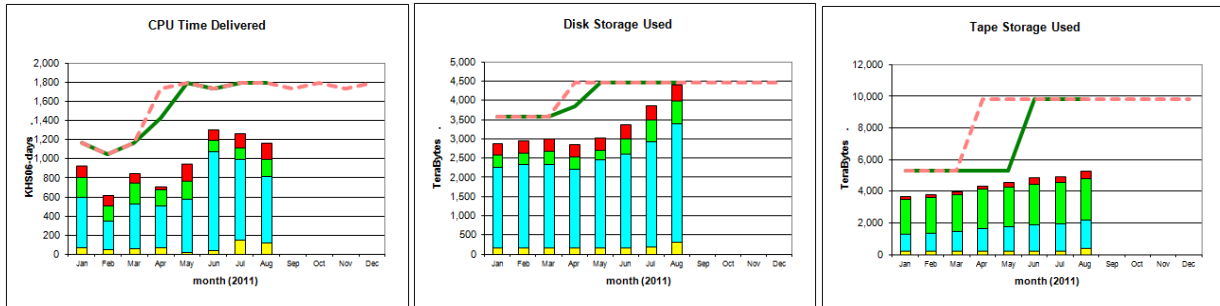


Figure 1: Accounting for CERN January - August 2011

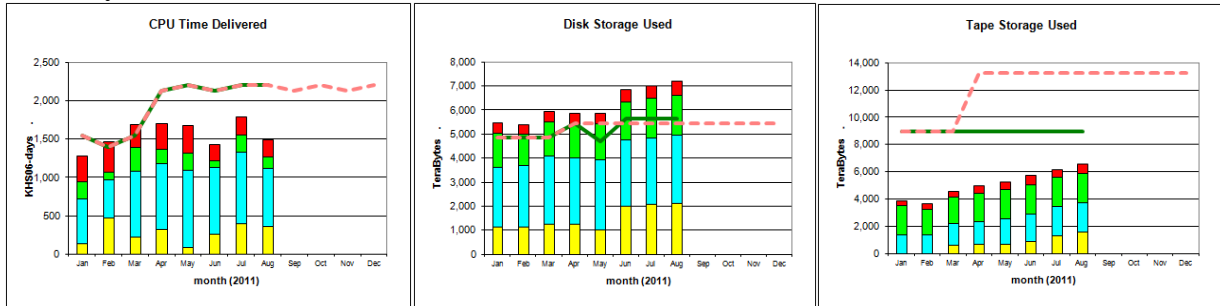
Canada, TRIUMF



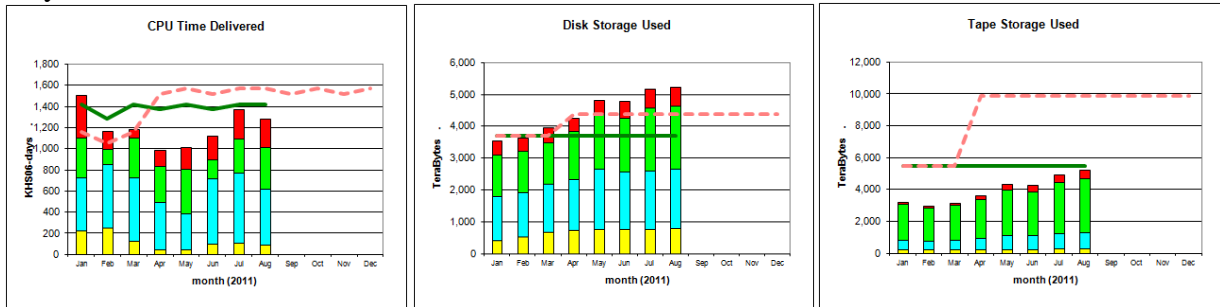
France, CC-IN2P3



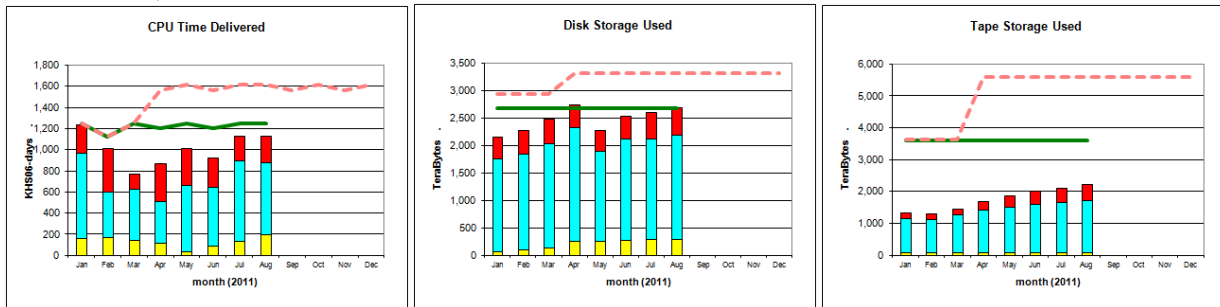
Germany, KIT



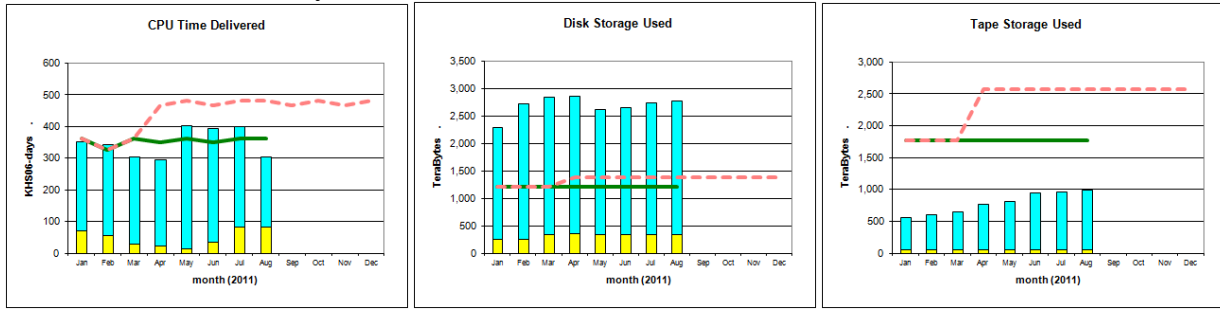
Italy, CNAF



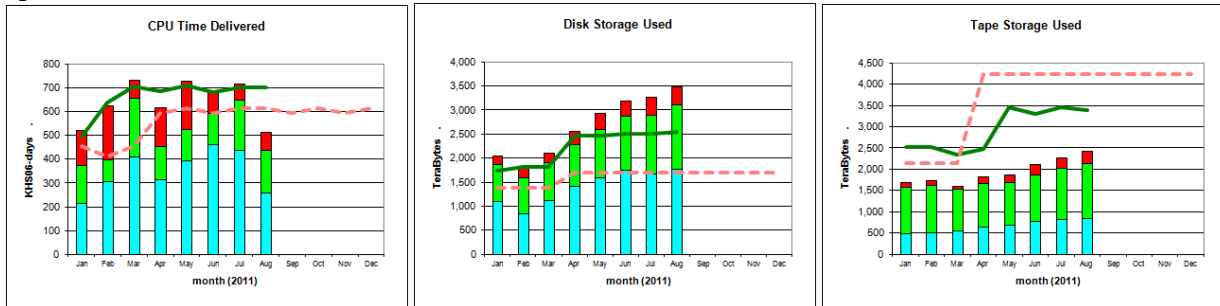
Netherlands, LHC/Tier1



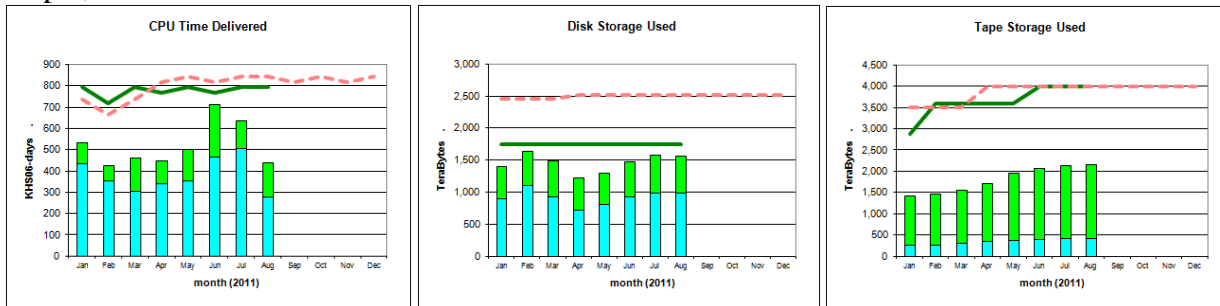
Nordic Data Grid Facility (NDGF)



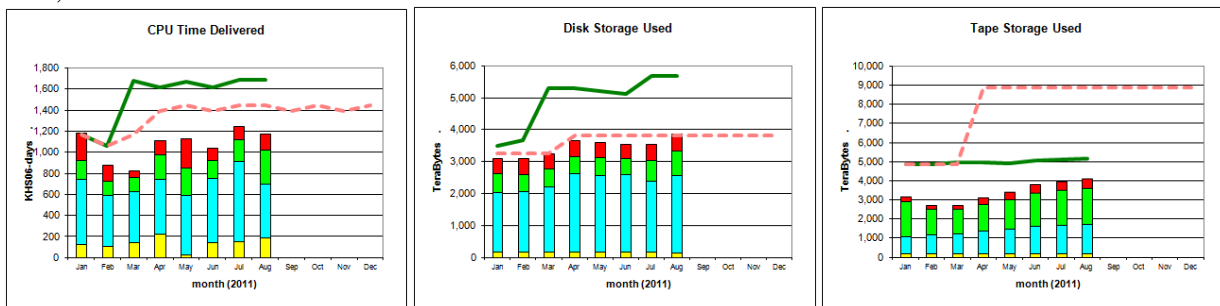
Spain, PIC



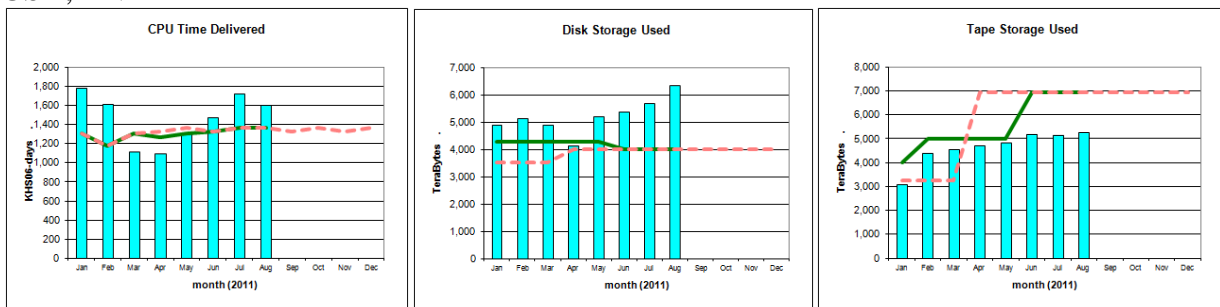
Taipei, ASGC



UK, RAL



USA, BNL



USA, FNAL

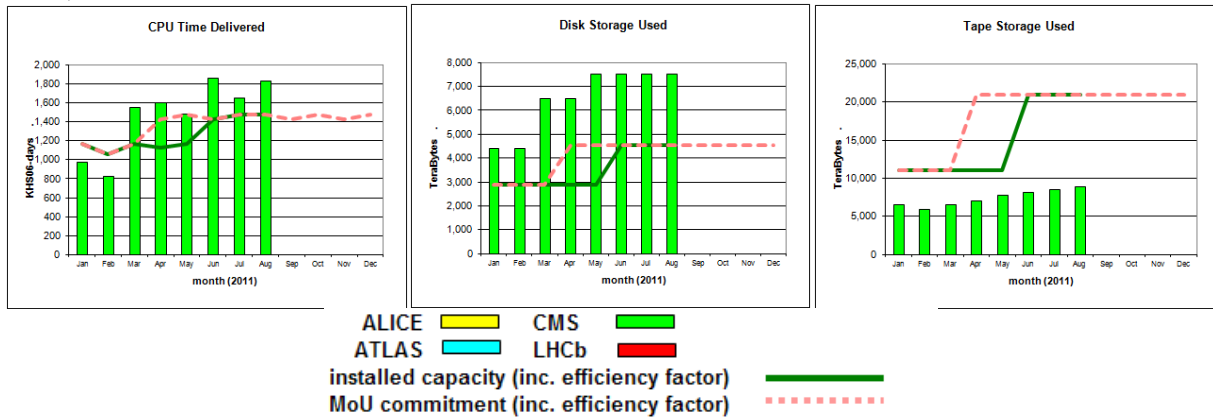


Figure 2: Accounting for External Tier1s January - August 2011

4.2 Tier2 Accounting

Tier2 accounting began in September 2007 and as for Tier1 accounting, past reports can be found on the LCG Document Repository Accounting page.

Figure 3 shows the Federations with 2011 pledge values above 9000 HS06 and Figure 4 all those with 2011 pledge values below 9000 HS06, in both cases ordered by pledge and showing CPU used monthly from May to August 2011 inclusive.

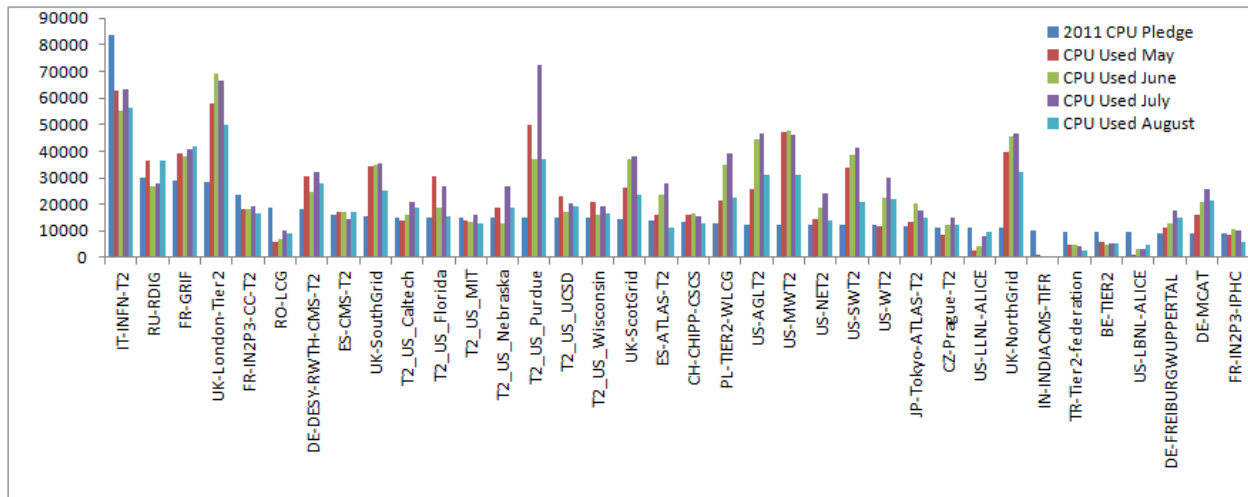


Figure 3: Accounting for Tier2 Federations with 2011 CPU pledge > 9000 HS06 May-August 2011

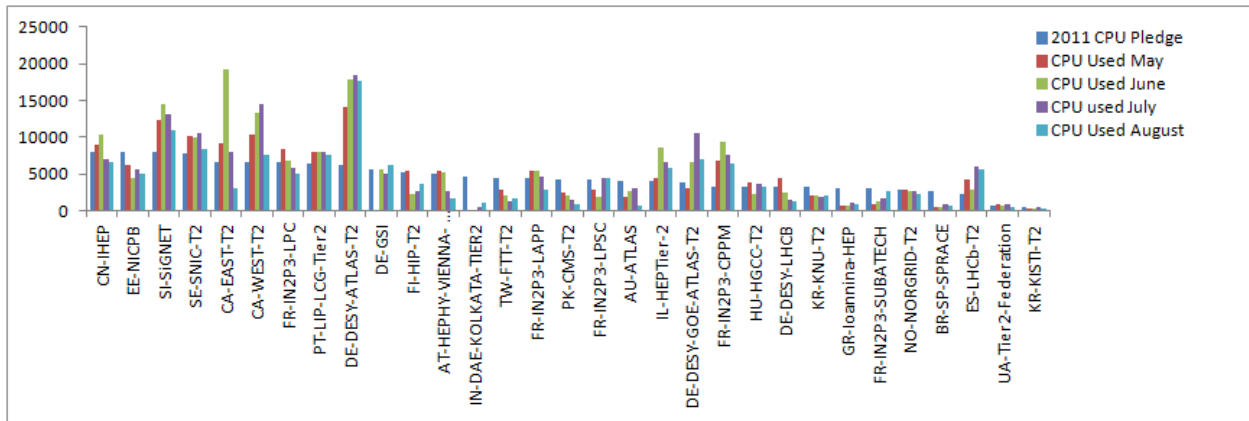


Figure 4: Accounting for Tier2 Federations with 2011 CPU pledge < 9000 HS06 May-August 2011

Encouraging results from many of the Tier2s continue to be demonstrated and Ukraine is now included in the monthly reports. The Indian DAE-KOLKATA Federation is now reporting again and due to a very lengthy purchase procedure which is still ongoing the other Indian Federation, CMS-TIFR is operating significantly below the 2011 pledge level. The LCG Office is being kept informed of the situation.

The Tier-2 country view of cumulative normalised CPU time between January and August 2011 is shown in figure 5. This and several other graphs and reports are available from the EGI Accounting portal.

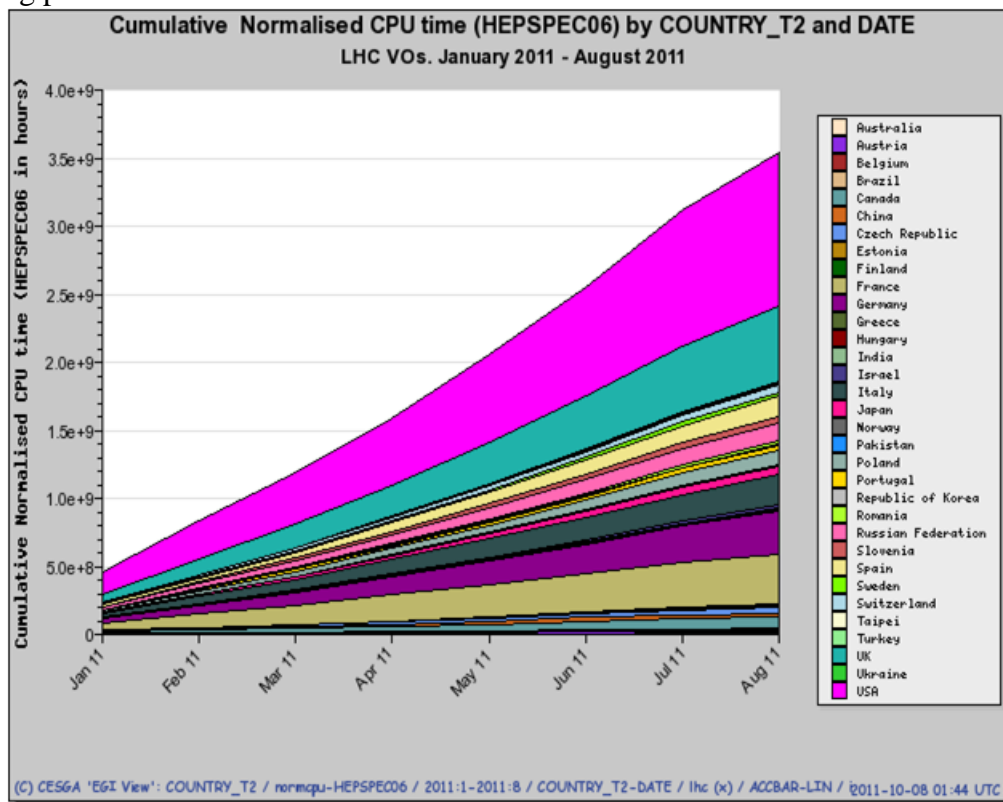


Figure 5: Tier2 cumulative normalised CPU time by country January-August 2011

Recent meetings of the LHCC and WLCG Overview Board noted positive progress of resource use at CERN the Tier1 and Tier2 sites.

5. Status of experiment requirements and resource pledges

Since the last C-RRB meeting, at which the installation status of 2011 resources was shown, sites who had not already met their pledge continued their installations with progress reported to the LCG Office in several cases. The regular accounting reports showed a positive evolution and good use of the resources made available.

At the last meeting the intention to use the REBUS (REsource Balance and Usage) tool for 2012 and 2013 pledge data collection was announced, with a deadline for input of 30/09/11. The Resources Scrutiny Group (RSG) approved Experiment Requirements were sent on 13/05/11 as input to the Funding Agencies and Federations to work on their 2012 and 2013 pledges.

Mailing lists were established for each Federation with the Funding Agency representative names, the names of those who provided pledge information in the past and other names added on request. Certain Federations had difficulty to input their pledge data due to access problems which were resolved in most cases apart from a couple due to firewall restrictions. By the deadline of 30th September all but one of the Tier1 Federations had submitted their pledges, and all but 8 of the Tier2 Federations. The deadline was extended which permitted the Federations who were late to enter their data. Despite this changed way of working for the first time ever a complete pledge summary table is available for the Autumn C-RRB meeting – thanks to the efforts of all involved to make this happen.

Figure 6 gives the global pledge summary status for 2012 by experiment, and annexe 1 of this report gives the detailed breakdown for 2011, 2012 and 2013.

Tier	Pledge Type	ALICE	Required	Balance	ATLAS	Required	Balance	CMS	Required	Balance	LHCb	Required	Balance	SUM	Required	Balance
Tier 0	CPU (HEP-SPEC06)	90,000	116,000	-22%	111,000	73,000	52%	121,000	120,000	1%	34,000	34,000	0%	356,000	343,000	4%
Tier 0	Disk (Tbytes)	8,100	14,300	-43%	9,000	9,000	0%	7,000	5,500	27%	3,500	3,500	0%	27,600	32,300	-15%
Tier 0	Tape (Tbytes)	20,000	20,000	0%	18,000	18,000	0%	23,000	23,000	0%	6,400	6,000	7%	67,400	67,000	1%
Tier 1	CPU (HEP-SPEC06)	94,507	160,000	-41%	290,172	259,000	12%	137,435	145,000	-5%	90,567	113,000	-20%	612,681	677,000	-10%
Tier 1	Disk (Tbytes)	7,220	10,800	-33%	30,728	27,000	14%	21,272	22,000	-3%	7,360	9,500	-23%	66,580	69,300	-4%
Tier 1	Tape (Tbytes)	11,523	21,000	-45%	39,108	36,000	9%	46,731	51,000	-8%	5,572	6,000	-7%	102,934	114,000	-10%
Tier 2	CPU (HEP-SPEC06)	112,315	145,000	-20%	330,025	266,000	26%	312,857	315,000	2%	47,295	43,000	10%	802,492	769,000	7%
Tier 2	Disk (Tbytes)	8,830	8,300	10%	44,531	47,000	-4%	26,042	26,000	2%	209	20	1380%	79,612	81,320	0%

Figure 6: Summary of pledge situation for 2012: Experiment requirements RSG approved 13/05/11 compared to pledge data entered up to 12/10/11

This summary shows that ATLAS is in a very comfortable position with respect to 2012 resources, CMS has slight shortfall with respect to Tier1 CPU, disk and tape, LHCb more significant shortfall with respect to Tier1 CPU, disk and tape and that ALICE has very significant shortfall with Tier0 CPU and disk, Tier1 CPU, disk and tape and Tier2 CPU. Globally there is shortfall for disk at CERN and CPU, disk and Tape at the Tier1s. It should be noted that recent increased requirements have come from the experiments which are currently being

scrutinised and which could change the balance depending on the outcome of the scrutiny process.

6. Conclusion

Two additional WLCG MoU signatures have been obtained for new Tier2 Federations: one with Greece for a CMS Tier2 and the other with US LBNL for an ALICE Tier2. A letter of Intent was received from US LLNL who have been granted full member access as an ALICE Tier2 while waiting for the MoU signature. Discussions with other countries and Federations for new signatures are on-going.

The WLCG Project planning continues to be revised frequently as a consequence of the various influencing factors including revised resource requirements. Carry forward of unspent project budget from one budget year to the next should continue to help compensate the currently estimated materials budget shortfall particularly in 2012. The project planning will continue to be revised particularly as a function of the approved experiment resource requirements for 2012 & 2013 and the adjudication of the Call for Tender for the remote Tier0 centre.

Tier0, Tier1 and Tier2 accounting continues to be closely monitored and monthly reports are published on the WLCG website and distributed to the Overview Board. All Tier2 sites are now reporting and globally the resource usage is positive.

The REBUS tool has been used to enter 2012 and 2013 resource pledge data for the first time at the source by the Federations. This appears to have gone smoothly and following an extended deadline, all pledge data was collected. The summary of the 2011, 2012 and 2013 pledges and the status of 2012 pledges compared to the experiment requirements approved by the RSG in May 2011 is presented in annex 1.

CERN Tier0 / CAF	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	264100	356000	356000	Offered	90000	111000	121000	34000	356000
				Required	116000	73000	120000	34000	343000
				% of Req.	78%	152%	101%	100%	104%
Disk (Tbytes)	19100	27600	29100	Offered	8100	9000	7000	3500	27600
				Required	14300	9000	5500	3500	32300
				% of Req.	57%	100%	127%	100%	85%
Tape (Tbytes)	43100	67400	70700	Offered	20000	18000	23000	6400	67400
				Required	20000	18000	23000	6000	67000
				% of Req.	100%	100%	100%	107%	101%

Canada Tier1	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	11300	25900	27300	Offered		25900			25900
				% of Total		10%			10%
Disk (Tbytes)	1240	2700	3000	Offered		2700			2700
				% of Total		10%			10%
Tape (Tbytes)	1505	3600	4000	Offered		3600			3600
				% of Total		10%			10%

KIT	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	83550	106580	108200	Offered	40000	32380	15000	19200	106580
				% of Total	25%	13%	10%	17%	16%
Disk (Tbytes)	7805	9885	11030	Offered	2700	3375	2200	1610	9885
				% of Total	25%	13%	10%	17%	14%
Tape (Tbytes)	13290	15900	19260	Offered	5250	4500	5100	1050	15900
				% of Total	25%	13%	10%	18%	14%

IN2P3 Lyon	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	72331	70150	70150	Offered	7700	33050	10700	18700	70150
				% of Total	5%	13%	7%	17%	10%
Disk (Tbytes)	6761	7240	7240	Offered	900	3620	1630	1090	7240
				% of Total	8%	13%	7%	11%	10%
Tape (Tbytes)	10426	9000	9000	Offered	800	3400	3800	1000	9000
				% of Total	4%	9%	7%	17%	8%

INFN CNAF	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	59500	85000	85000	Offered	25000	25000	18500	16500	85000
				% of Total	16%	10%	13%	15%	13%
Disk (Tbytes)	6250	8500	8950	Offered	1600	2700	2800	1400	8500
				% of Total	15%	10%	13%	15%	12%
Tape (Tbytes)	9900	14100	16600	Offered	3000	3600	6600	900	14100
				% of Total	14%	10%	13%	15%	12%

Netherlands LHC/Tier1 (Note 1)	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	61296	59790	63790	Offered	6072	38194		15524	59790
				% of Total	4%	15%		14%	11%
Disk (Tbytes)	4736	5243	5743	Offered	479	3756		1008	5243
				% of Total	4%	14%		11%	11%
Tape (Tbytes)	5593	6793	7993	Offered	292	5301		1200	6793
				% of Total	1%	15%		20%	11%

NDGF Tier1	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	18319	25764	28049	Offered	12535	13229			25764
				% of Total	8%	5%			6%
Disk (Tbytes)	1964	2690	2987	Offered	1325	1365			2690
				% of Total	12%	5%			7%
Tape (Tbytes)	2566	3672	4560	Offered	1761	1911			3672
				% of Total	8%	5%			6%

Spain PIC	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	23272	26367	26928	Offered		13209	7395	5763	26367
				% of Total		5%	5%	5%	5%
Disk (Tbytes)	2438	2984	3473	Offered		1377	1122	485	2984
				% of Total		5%	5%	5%	5%
Tape (Tbytes)	4234	4743	5457	Offered		1836	2601	306	4743
				% of Total		5%	5%	5%	5%

Taipei ASGC	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	32000	33075	33874	Offered		16835	16240		33075
				% of Total		7%	11%		8%
Disk (Tbytes)	3600	3920	4275	Offered		2160	1760		3920
				% of Total		8%	8%		8%
Tape (Tbytes)	4000	4710	5940	Offered		2160	2550		4710
				% of Total		6%	5%		5%

UK Tier1 (Notes 2 + 3)	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	54736	62055	62629	Offered	3200	32375	11600	14880	62055
				% of Total	2%	13%	8%	13%	9%
Disk (Tbytes)	5469	7118	8149	Offered	216	3375	1760	1767	7118
				% of Total	2%	13%	8%	19%	10%
Tape (Tbytes)	8860	10116	11768	Offered	420	4500	4080	1116	10116
				% of Total	2%	13%	8%	19%	9%

US-ATLAS Tier1	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	51980	60000	63000	Offered		60000			60000
				% of Total		23%			23%
Disk (Tbytes)	5704	6300	7000	Offered		6300			6300
				% of Total		23%			23%
Tape (Tbytes)	6923	8300	9200	Offered		8300			8300
				% of Total		23%			23%

US-CMS Tier1	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	56000	58000	58000	Offered			58000		58000
				% of Total			40%		40%
Disk (Tbytes)	6500	10000	11000	Offered			10000		10000
				% of Total			45%		45%
Tape (Tbytes)	21000	22000	24000	Offered			22000		22000
				% of Total			43%		43%

Summary Ext. Tier1s	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	524284	612681	626920	Offered	94507	290172	137435	90567	612681
				Required	160000	259000	145000	113000	677000
				Balance	-41%	12%	-5%	-20%	-10%
Disk (Tbytes)	52467	66580	72847	Offered	7220	30728	21272	7360	66580
				Required	10800	27000	22000	9500	69300
				Balance	-33%	14%	-3%	-23%	-4%
Tape (Tbytes)	88297	102934	117778	Offered	11523	39108	46731	5572	102934
				Required	21000	36000	51000	6000	114000
				Balance	-45%	9%	-8%	-7%	-10%

Ext. Tier1 Requ. 2012	ALICE	ATLAS	CMS	LHCb	SUM
CPU (HEP-SPEC06)	160000	259000	145000	113000	677000
Disk (Tbytes)	10800	27000	22000	9500	69300
Tape (Tbytes)	21000	36000	51000	6000	114000

TIER 1 Notes

Note 1: Netherlands: 2012 and 2013 are not yet fully negotiated with the funding agencies and like last years it is unlikely that they will be in place and operational for April of those years. Since our 2011 purchase has just become operational we have plenty of capacity growth of the experiments.

Note 2: UK : The LHCb CPU pledge is based on the average LHCb Tier-1 CPU requirement, rather than the peak requirement, on the assumption that the UK Tier-1 should be able to meet peak requirements for LHCb by adjusting the fair-shares during the peak periods.

Note 3: UK: UK Tape is provisioned on demand. The full pledge will not be deployed until required.

See also the online WLCG Resources Pledges database at: <http://gstat-wlcg.cern.ch/apps/pledges/>

	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
Australia, University of Melbourne									
CPU (HEP-SPEC06)	4000	6500	6500	Offered		6500			6500
				% of Total		2%			1%
Disk (Tbytes)	400	700	700	Offered		700			700
				% of Total		1%			1%
Austria, Austrian Tier-2 Federation									
CPU (HEP-SPEC06)	5057	5057	5057	Offered		1857	3200		5057
				% of Total		1%	1%		2%
Disk (Tbytes)	420	420	420	Offered		120	300		420
				% of Total		0%	1%		1%
Belgium, Belgian Tier-2 Fed. FNRS/FWO									
CPU (HEP-SPEC06)	9600	9600	9600	Offered			9600		9600
				% of Total			3%		3%
Disk (Tbytes)	1190	1560	1560	Offered			1560		1560
				% of Total			6%		6%
Brazil, SPRACE, Sao Paulo									
CPU (HEP-SPEC06)	2630	10000	10000	Offered			10000		10000
				% of Total			3%		3%
Disk (Tbytes)	120	720	720	Offered			720		720
				% of Total			3%		3%
Canada, Canada-East Federation									
CPU (HEP-SPEC06)	6672	6650	7225	Offered		6650			6650
				% of Total		3%			3%
Disk (Tbytes)	902	1175	1325	Offered		1175			1175
				% of Total		3%			3%
Canada, Canada-West Federation									
CPU (HEP-SPEC06)	6672	6650	7225	Offered		6650			6650
				% of Total		3%			3%
Disk (Tbytes)	902	1175	1325	Offered		1175			1175
				% of Total		3%			3%
China, IHEP, Beijing									
CPU (HEP-SPEC06)	8000	9600	9600	Offered		4800	4800		9600
				% of Total		2%	2%		2%
Disk (Tbytes)	600	640	640	Offered		320	320		640
				% of Total		1%	1%		1%
Czech Rep., FZU, Prague									
CPU (HEP-SPEC06)	11500	15000	13000	Offered	5000	10000			15000
				% of Total	3%	4%			4%
Disk (Tbytes)	1060	1450	1350	Offered	420	1030			1450
				% of Total	5%	2%			3%
Estonia, NICPB, Tallinn									
CPU (HEP-SPEC06)	8000	10000	16000	Offered			10000		10000
				% of Total			3%		3%
Disk (Tbytes)	280	750	750	Offered			750		750
				% of Total			3%		3%
Finland, NDGF/HIP Tier-2									
CPU (HEP-SPEC06)	5250	6300	6300	Offered			6300		6300
				% of Total			2%		2%
Disk (Tbytes)	346	520	520	Offered			520		520
				% of Total			2%		2%
France, CC-IN2P3 AF, Lyon									
CPU (HEP-SPEC06)	23781	23850	23850	Offered	2300	9750	6600	5200	23850
				% of Total	2%	4%	2%	12%	3%
Disk (Tbytes)	2033	2090	2090	Offered	210	1310	570	0	2090
				% of Total	3%	3%	2%	0%	3%
France, CPPM, Marseille									
CPU (HEP-SPEC06)	3350	4264	4264	Offered		2264		2000	4264
				% of Total		1%		5%	1%
Disk (Tbytes)	254	404	419	Offered		400		4	404
				% of Total		1%		20%	1%
France, GRIF, Paris									
CPU (HEP-SPEC06)	28960	30173	32679	Offered	6685	10100	9324	4064	30173
				% of Total	5%	4%	3%	9%	4%
Disk (Tbytes)	2221	2940	3294	Offered	382	1786	770	2	2940
				% of Total	5%	4%	3%	10%	4%
France, IPHC, Strasbourg									
CPU (HEP-SPEC06)	9100	11000	11000	Offered	3500		7500		11000
				% of Total	2%		2%		2%
Disk (Tbytes)	550	800	800	Offered	200		600		800
				% of Total	2%		2%		2%
France, LAPP, Annecy									
CPU (HEP-SPEC06)	4400	4800	5600	Offered		3200		1600	4800
				% of Total		1%		4%	2%
Disk (Tbytes)	412	562	652	Offered		560		2	562
				% of Total		1%		10%	1%
France, LPC, Clermont									
CPU (HEP-SPEC06)	6527	6527	8000	Offered	2078	3146		1303	6527
				% of Total	1%	1%		3%	1%
Disk (Tbytes)	609	677	796	Offered	119	556		2	677
				% of Total	1%	1%		10%	1%

Country/Region	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
France, LPSC Grenoble									
CPU (HEP-SPEC06)	4246	4222	4613	Offered	1900	2322			4222
				% of Total	1%	1%			1%
Disk (Tbytes)	419	519	589	Offered	109	410			519
				% of Total	0%	0%			0%
France, Subatech, Nantes									
CPU (HEP-SPEC06)	3000	3000	3000	Offered	3000				3000
				% of Total	2%				2%
Disk (Tbytes)	270	310	310	Offered	310				310
				% of Total	4%				4%
Germany, ATLAS Federation, DESY									
CPU (HEP-SPEC06)	6200	12000	12000	Offered		12000			12000
				% of Total		5%			5%
Disk (Tbytes)	1050	1500	1500	Offered		1500			1500
				% of Total		3%			3%
Germany, ATLAS Federation, U. Goettingen									
CPU (HEP-SPEC06)	3800	3853	3853	Offered		3853			3853
				% of Total		1%			1%
Disk (Tbytes)	400	1000	1000	Offered		1000			1000
				% of Total		2%			2%
Germany, CMS Federation DESY RWTH Aachen									
CPU (HEP-SPEC06)	18400	23625	23625	Offered			23625		23625
				% of Total			8%		8%
Disk (Tbytes)	970	1950	1950	Offered			1950		1950
				% of Total			8%		8%
Germany, DESY-LHCb									
CPU (HEP-SPEC06)	3200	3200	3200	Offered				3200	3200
				% of Total				7%	7%
Disk (Tbytes)	2	2	2	Offered				2	2
				% of Total				10%	10%
Germany, GSI, Darmstadt									
CPU (HEP-SPEC06)	5700	7000	7000	Offered	7000				7000
				% of Total	5%				5%
Disk (Tbytes)	440	550	550	Offered	550				550
				% of Total	7%				7%
Germany, ATLAS Federation Munich									
CPU (HEP-SPEC06)	9220	11560	11560	Offered		11560			11560
				% of Total		4%			4%
Disk (Tbytes)	1040	1340	1340	Offered		1340			1340
				% of Total		3%			3%
Germany, ATLAS Fed. Freiburg Wuppertal									
CPU (HEP-SPEC06)	9243	8860	8860	Offered		8860			8860
				% of Total		3%			3%
Disk (Tbytes)	1151	1566	1566	Offered		1566			1566
				% of Total		3%			3%
Greece, HEP Laboratory, University of Ioannina									
CPU (HEP-SPEC06)	3040	3040	3040	Offered			3040		3040
				% of Total			1%		1%
Disk (Tbytes)	200	200	200	Offered			200		200
				% of Total			1%		1%
Hungary, HGCC Federation									
CPU (HEP-SPEC06)	3340	3760	4300	Offered	960		2800		3760
				% of Total	1%		1%		1%
Disk (Tbytes)	146	204	282	Offered	54		150		204
				% of Total	1%		1%		1%
India, VECC/SINP, Kolkata									
CPU (HEP-SPEC06)	4700	6000	6000	Offered	6000				6000
				% of Total	4%				4%
Disk (Tbytes)	150	240	240	Offered	240				240
				% of Total	3%				3%
India, TIFR, Mumbai (Note 1)									
CPU (HEP-SPEC06)	10400	3000	7000	Offered			3000		3000
				% of Total			1%		1%
Disk (Tbytes)	750	700	850	Offered			700		700
				% of Total			3%		3%
Israel, IL-HEP Tier-2 Federation									
CPU (HEP-SPEC06)	4000	4800	5400	Offered		4800			4800
				% of Total		2%			2%
Disk (Tbytes)	560	735	840	Offered		735			735
				% of Total		2%			2%
Italy, INFN T2 Federation									
CPU (HEP-SPEC06)	84000	102100	102100	Offered	25000	26600	44000	6500	102100
				% of Total	17%	10%	14%	15%	13%
Disk (Tbytes)	5900	8200	8200	Offered	1400	3400	3400		8200
				% of Total	17%	7%	13%		10%
Japan, ICEPP, Tokyo									
CPU (HEP-SPEC06)	12000	12000	15000	Offered		12000			12000
				% of Total		5%			5%
Disk (Tbytes)	1000	1200	1500	Offered		1200			1200
				% of Total		3%			3%

Country/Region	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
Republic of Korea, KISTI, Daejeon									
CPU (HEP-SPEC06)	600	600	600	Offered	600				600
				% of Total	0%				0%
Disk (Tbytes)	50	50	50	Offered	50				50
				% of Total	1%				1%
Republic of Korea, CHEP of KNU, Daegu									
CPU (HEP-SPEC06)	3200	3600	4000	Offered			3600		3600
				% of Total			1%		1%
Disk (Tbytes)	230	250	250	Offered			250		250
				% of Total			1%		1%
Norway, UNINETT SIGMA Tier2									
CPU (HEP-SPEC06)	2905	3275	3838	Offered		3275			3275
				% of Total		1%			1%
Disk (Tbytes)	273	488	620	Offered		488			488
				% of Total		1%			1%
Pakistan, Pakistan Tier-2 Federation									
CPU (HEP-SPEC06)	4352	5440	6365	Offered			5440		5440
				% of Total			2%		2%
Disk (Tbytes)	300	300	300	Offered			300		300
				% of Total			1%		1%
Poland, Polish Tier-2 Federation									
CPU (HEP-SPEC06)	13050	15800	18200	Offered	4240	4840	4060	2660	15800
				% of Total	3%	2%	1%	6%	2%
Disk (Tbytes)	810	1010	1180	Offered	300	480	230		1010
				% of Total	4%	1%	1%		1%
Portugal, LIP Tier-2 Federation									
CPU (HEP-SPEC06)	6400	6400	6400	Offered		3200	3200		6400
				% of Total		1%	1%		1%
Disk (Tbytes)	420	420	420	Offered		220	200		420
				% of Total		0%	1%		1%
Romania, Romanian Tier-2 Federation									
CPU (HEP-SPEC06)	19000	26400	27400	Offered	3200	19400		3800	26400
				% of Total	2%	7%		9%	6%
Disk (Tbytes)	1705	1940	1990	Offered	1200	700		40	1940
				% of Total	14%	1%		200%	4%
Russian Federation, RDIG (note 2)									
CPU (HEP-SPEC06)	30000	51498	63036	Offered	14530	17105	17105	2758	51498
				% of Total	10%	6%	5%	6%	7%
Disk (Tbytes)	2800	4429	5534	Offered	1250	1471	1471	237	4429
				% of Total	15%	3%	6%	1185%	5%
Slovenia, SIGNET, Jozef Stefan Inst.									
CPU (HEP-SPEC06)	8000	12000	20000	Offered		12000			12000
				% of Total		5%			5%
Disk (Tbytes)	600	900	1500	Offered		900			900
				% of Total		2%			2%
Spain, ATLAS Federation									
CPU (HEP-SPEC06)	13900	13300	14450	Offered		13300			13300
				% of Total		5%			5%
Disk (Tbytes)	1880	2350	2650	Offered		2350			2350
				% of Total		5%			5%
Spain, CMS Federation									
CPU (HEP-SPEC06)	16000	15750	15750	Offered			15750		15750
				% of Total			5%		5%
Disk (Tbytes)	1000	1300	1300	Offered			1300		1300
				% of Total			5%		5%
Spain, LHCb Federation									
CPU (HEP-SPEC06)	2340	2800	2800	Offered				2800	2800
				% of Total				7%	7%
Disk (Tbytes)	1	1	1	Offered				1	1
				% of Total				5%	5%
Sweden, SNIC Tier2									
CPU (HEP-SPEC06)	7870	7870	7870	Offered	2820	5050			7870
				% of Total	2%	2%			2%
Disk (Tbytes)	920	920	920	Offered	400	520			920
				% of Total	5%	1%			2%
Switzerland, CHIPP, Manno									
CPU (HEP-SPEC06)	13550	17670	20800	Offered		7100	7100	3470	17670
				% of Total		3%	2%	8%	3%
Disk (Tbytes)	975	1226	1474	Offered		612	612	2	1226
				% of Total		1%	2%	10%	2%
Taipei, Taiwan Analysis Facility Federation									
CPU (HEP-SPEC06)	4480	5320	6000	Offered		2660	2660		5320
				% of Total		1%	1%		1%
Disk (Tbytes)	480	600	650	Offered		340	260		600
				% of Total		1%	1%		1%
Turkey, Turkish Tier-2 Federation									
CPU (HEP-SPEC06)	9800	9800	9800	Offered		5100	4700		9800
				% of Total		2%	1%		2%
Disk (Tbytes)	900	900	900	Offered		550	350		900
				% of Total		1%	1%		1%

UK, London	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	28186	26225	27094	Offered		10050	14809	1366	26225
				% of Total		4%	5%	3%	4%
Disk (Tbytes)	2440	3079	3295	Offered		1688	1390	1	3079
				% of Total		4%	5%	5%	4%

UK, NorthGrid	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	11185	15953	17121	Offered		13508		2445	15953
				% of Total		5%		6%	5%
Disk (Tbytes)	1540	2170	2447	Offered		2169		1	2170
				% of Total		5%		5%	5%

UK, ScotGrid	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	14630	9635	10233	Offered		6918		2717	9635
				% of Total		3%		6%	3%
Disk (Tbytes)	1238	1291	1456	Offered		1290		1	1291
				% of Total		3%		5%	3%

UK, SouthGrid	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15425	17536	17716	Offered	2900	2775	10391	1470	17536
				% of Total	2%	1%	3%	3%	2%
Disk (Tbytes)	1210	1585	1678	Offered	166	728	690	1	1585
				% of Total	2%	2%	3%	5%	2%

Ukraine, Ukrainian Tier-2 Federation	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	637	990	1100	Offered	690		300		990
				% of Total	0%		0%		0%
Disk (Tbytes)	100	100	100	Offered	80		20		100
				% of Total	1%		0%		0%

USA, LBNL ALICE Berkeley CA	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	9500	12000	14500	Offered	12000				12000
				% of Total	8%				8%
Disk (Tbytes)	740	1020	1200	Offered	1020				1020
				% of Total	12%				12%

USA, LLNL ALICE, Livermore CA	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	11500	11500	11500	Offered	11500				11500
				% of Total	8%				8%
Disk (Tbytes)	650	650	650	Offered	650				650
				% of Total	8%				8%

USA, Northeast ATLAS T2 (Note 3)	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	12232	12500	13400	Offered		12500			12500
				% of Total		5%			5%
Disk (Tbytes)	1654	1648	2500	Offered		1648			1648
				% of Total		4%			4%

USA, Southwest ATLAS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	12232	12500	13400	Offered		12500			12500
				% of Total		5%			5%
Disk (Tbytes)	1654	2200	2500	Offered		2200			2200
				% of Total		5%			5%

USA, Midwest ATLAS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	12232	12500	13400	Offered		12500			12500
				% of Total		5%			5%
Disk (Tbytes)	1654	2200	2500	Offered		2200			2200
				% of Total		5%			5%

USA, Great Lakes ATLAS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	12232	12500	13400	Offered		12500			12500
				% of Total		5%			5%
Disk (Tbytes)	1654	2200	2500	Offered		2200			2200
				% of Total		5%			5%

USA, SLAC ATLAS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	12232	12500	13400	Offered		12500			12500
				% of Total		5%			5%
Disk (Tbytes)	1654	2200	2500	Offered		2200			2200
				% of Total		5%			5%

USA, Caltech CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

USA, Florida CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

USA, MIT CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

USA, Nebraska CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

USA, Purdue CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

USA, UC San Diego CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

USA, U. Wisconsin CMS T2	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	SUM 2012
CPU (HEP-SPEC06)	15000	12500	12500	Offered			12500		12500
				% of Total			4%		4%
Disk (Tbytes)	900	1000	1000	Offered			1000		1000
				% of Total			4%		4%

Summary Tier2s with Split in 2012	2011	2012	2013	Split 2012	ALICE	ATLAS	CMS	LHCb	Sum 2012
CPU (HEP-SPEC06)	740658	819353	877524	Offered	115903	335693	320404	47353	819353
				Required	145000	266000	315000	43000	769000
				Balance	-20%	26%	2%	10%	7%
Disk (Tbytes)	62579	81226	88345	Offered	9110	45237	26583	296	81226
				Required	8300	47000	26000	20	81320
				Balance	10%	-4%	2%	1380%	0%

Requirements 2012	ALICE	ATLAS	CMS	LHCb	SUM
CPU (HEP-SPEC06)	145000	266000	315000	43000	769000
Disk (Tbytes)	8300	47000	26000	20	81320
Number of T2s					67

TIER 2 Notes

Note 1: India (Mumbai): CPU and storage hardware may not be fully online by April 2012

Note 2: Russia: CPU breakdown between VO's is not normally calculated as all CPU resources in all sites are available for all experiments. For the sake of REBUS, the 2011 disk VO allocation percentage has been used to calculate the theoretical breakdown between VO's.

Note 3: USA (NorthEast ATLAS): As of April 2012 USA, Northeast T2 will provide 1,648 TB of disk storage capacity that will grow to 2,324 TB by the end of calendar year 2012.

See also the online WLCG Resources Pledges database at: <http://gstat-wlcg.cern.ch/apps/pledges/>