

# Summary of 2011 DESY Grid Center Review

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## Abstract

The DESY Grid center includes the Grid Sites in Hamburg and Zeuthen and the National Analysis Facility (NAF), an analysis facility for the German LHC community, integrated in and complementing the DESY-HH and DESY-ZN Grid infrastructure.

A review of the services provided and functionality, capacity and performance upgrades required was performed end of 2010. This report summarizes the findings and recommendations of this review.

## Members of the review team:

Gerhard Brandt (ATLAS), Ulrich Husemann (ATLAS), Matthias Kasemann (CMS, chair), Hartmut Stadie (CMS), Kai Leffhalm (DV), Yves Kemp (IT) and Christoph Wissing (IT).



# Current Resources (DESY Grid and NAF)

	November 2010			April 2011		
	DESY-HH	DESY-ZN	NAF	DESY-HH	DESY-ZN	NAF
<b>CPU [#slots]</b>	4224	784	1620	4224	784	1620
<b>CPU total [kHS06]</b>	33.9 kHS06	8.6 kHS06	22 kHS06*	33.9 kHS06	8.6 kHS06	22 kHS06*
ATLAS T2 pledged CPU	4.8 kHS06			6.2 kHS06		
CMS T2 pledged CPU	8.0 kHS06			11.8 kHS06		
LHCb T2 pledged CPU	3.2 kHS06			3.2 kHS06		
<b>ATLAS disk total (dCache/Lustre)</b>	500 TB	518 TB	78 TB	890 TB	750 TB	135 TB
ATLAS T2 disk pledged (dCache)	740 TB			1050 TB		
<b>CMS DISK total (dCache/Lustre)</b>	660 TB*		58 TB	1057 TB*		58 TB
CMS T2 DISK pledged (dCache)	400 TB			640 TB		
<b>LHCb Disk total (dCache/Lustre)</b>		163 TB	47 TB		180 TB	47 TB
LHCb T2 Disk pledged (dCache)	2 TB			2 TB		
<b>Disk (other VOs, dCache/Lustre)</b>	140 TB	357 TB	33 TB	348 TB	500 TB	33 TB

\*: includes UniHH resources of 240 TB of dCache disk and 7.4 kHS04 of NAF CPU

Table 1: Existing DESY Grid Center resources in November 2010 and April 2011.



# DESY-T2 Pledges for 2011 - 2013

	2011 (CPU)	2011 (disk)	2012 (CPU)	2012 (disk)
<b>ATLAS DESY T2 (pledged)</b>	6.2 kHS06 (+29%)	1050 TB (+42%)	6.6 kHS06	1350 TB
<b>CMS DESY T2 (pledged)</b>	11.8 kHS06 (+47%)	640 TB (+60%)	12.9 kHS06	900 TB
<b>LHCb DESY T2 (pledged)</b>	3.2 kHS06 (+0%)	2 TB (+0%)	3.2 kHS06	2 TB
<b>Total pledged</b>	21.2 kHS06 (+33%)	1692 TB (+48%)	22.7 kHS06	2252 TB

**Table 3: DESY Tier-2 center pledges in response to the 2010 WLCG requirements estimates. For 2011 the relative increase compared to the 2010 capacity is indicated. The 2012 pledges listed are outdated; they were revised based on updated requirements presented at the C-RRB in April 2011 (see Table 4).**

	2012 (CPU)	2012 (disk)	2013 (CPU)	2013 (disk)
<b>global ATLAS T2 increase</b>	6%	25%	7%	13%
<b>global CMS T2 increase</b>	10%	31%	0%	0%
<b>global LHCb T2 increase</b>	33%	0%	0%	0%
<b>Total DESY T2 increase</b>	22%	27%	1%	4%

**Table 4: CRSG-recommended increase of WLCG Tier-2 center capacity for 2012 and 2013 (preliminary). The total DESY increase requested is the weighted sum of ATLAS, CMS and LHCb increase. Pledges will be collected for the C-RRB in October 2011.**

- > Recommendations: Increase DESY-T2 capacities accordingly to the presented plans at the C-RRB in 2011.

# NAF Capacity

	2011 CPU	2011 storage dCache / High-I/O	2012 CPU	2012 storage	2013 CPU	2013 storage
ATLAS	-	1100 / 200 TB	+25%	+25%		
CMS	-	850 / 150 TB	+31%	+31%		
ILC, LHCb	-	200 / 50 TB	+10%	+10%		
<b>Total</b>	+100%	2150 / 400 TB	+25%	+25%	+25%	+25%

**Table 5: Recommended NAF capacity upgrades based on experiments requirements. 2013 values will be revised in 2012 when the experiments planning process finishes. For 2011 only the total CPU increase is given. For 2013 details are not known yet and will depend on the LHC running performance and schedule in 2012 and 2013, the rough expected total growth is indicated.**

## > Recommendations:

- Occupancy level should not exceed regularly 75% for the batch system
- Increase NAF capacity by a factor of 2 in 2011, afterward same grows as T2

