

Experiences and Future of the German CMS Tier-2 Centres

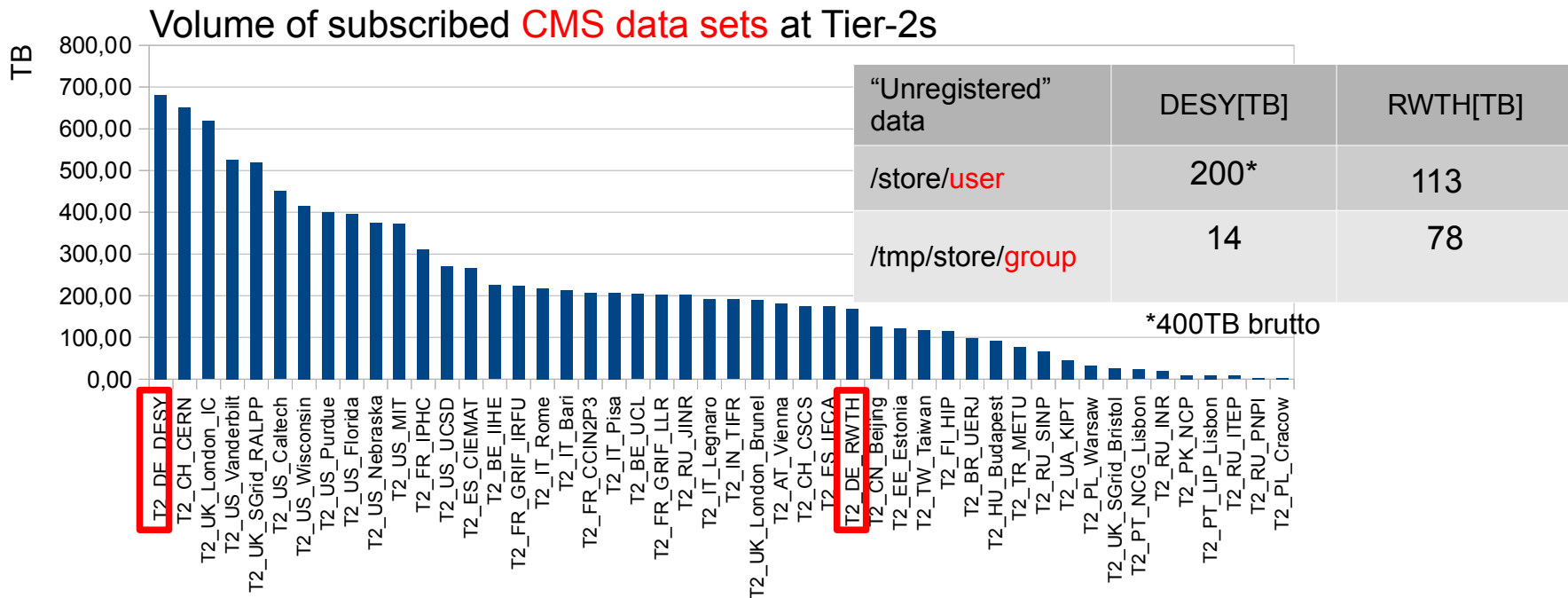
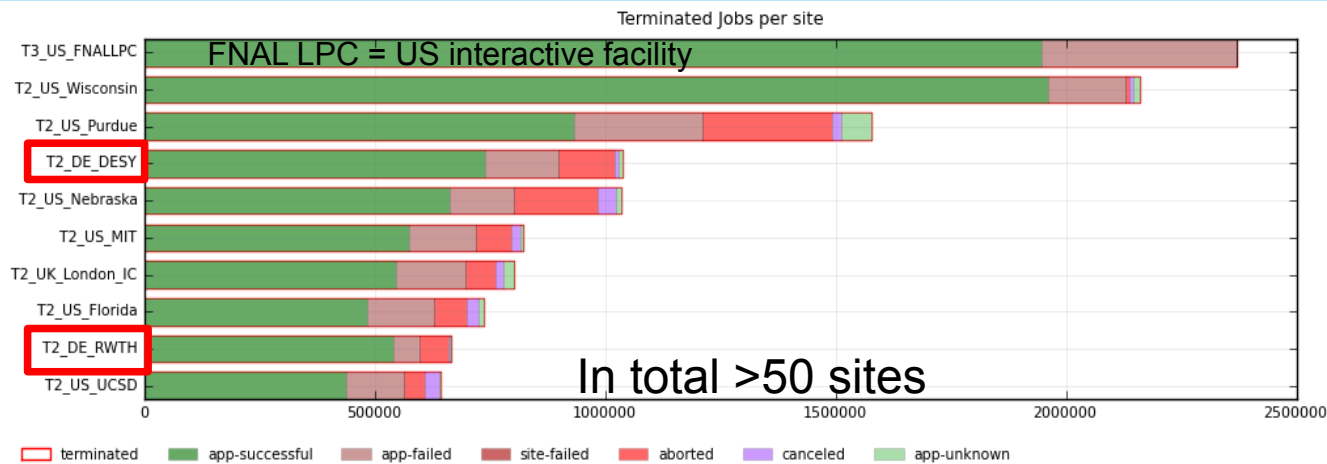
Thomas Kreß (RWTH Aachen IIIB)
&
Christoph Wissing (DESY)

HGF Terascale Annual Meeting
Bonn, December 8th, 2011

CMS Operations' Perspective

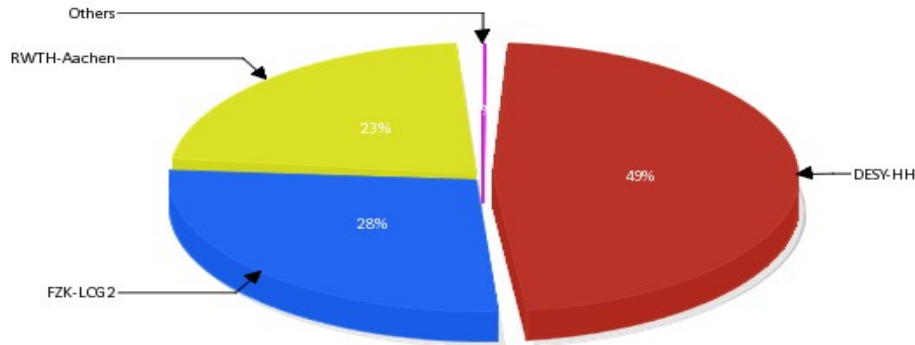
Status from beginning of Sep.

Analysis & MC production jobs since June 2011



Within CMS Germany Perspective

ROC Normalised CPU time (HEPSPEC06) per SITE



CMS **HEPSPECs** used 2011 (EGI)
All sites with significant share

All three sites provide also extra resources for German CMS users

© CERN EGI View: Germany / normcpu-HEPSPEC06 / 2011-1-2011-12 / VO-SITE / custom

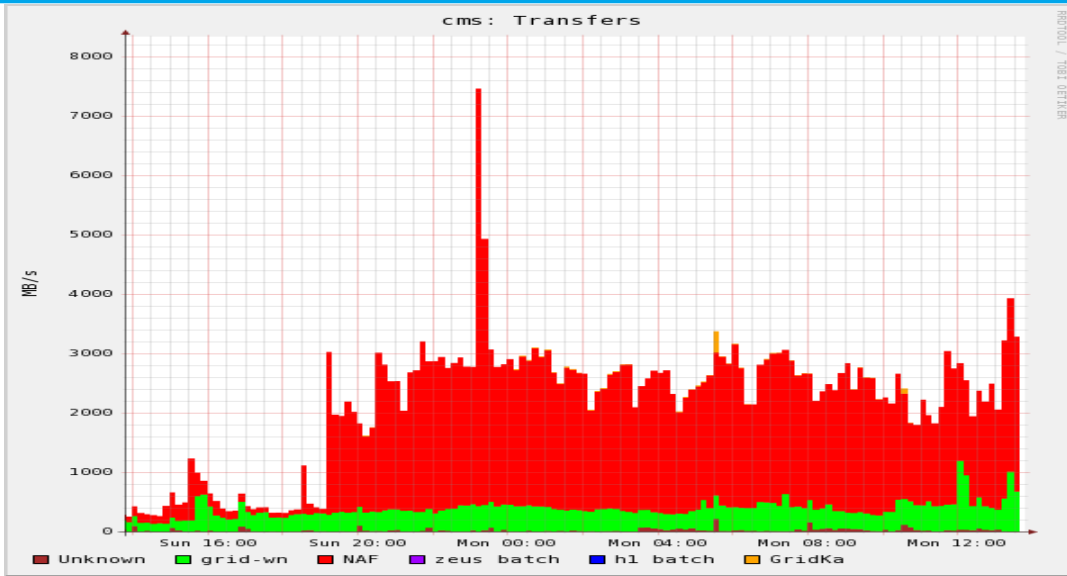
[show/hide details](#)

User data

Although flexible data placements are possible, most users prefer to use their “home site” to stage-out Grid job output

Institute User	T2_DE_RWTH	T2_DE_DESY	Total Usage
KIT	15.6 TB	46.1 TB	61.7 TB
DESY	0 TB	58.7 TB	58.7 TB
RWTH 1b	51 TB	0 TB	51 TB
Uni Hamburg	0 TB	50.1 TB	50.1 TB
RWTH 3a	30.8 TB	0 TB	30.9 TB
RWTH 3b	19.7 TB	0 TB	19.8 TB
Unrecognized OU	6.5 TB	15.9 TB	22.4 TB
Total Usage:	123.6 TB	170.9 TB	294.5 TB

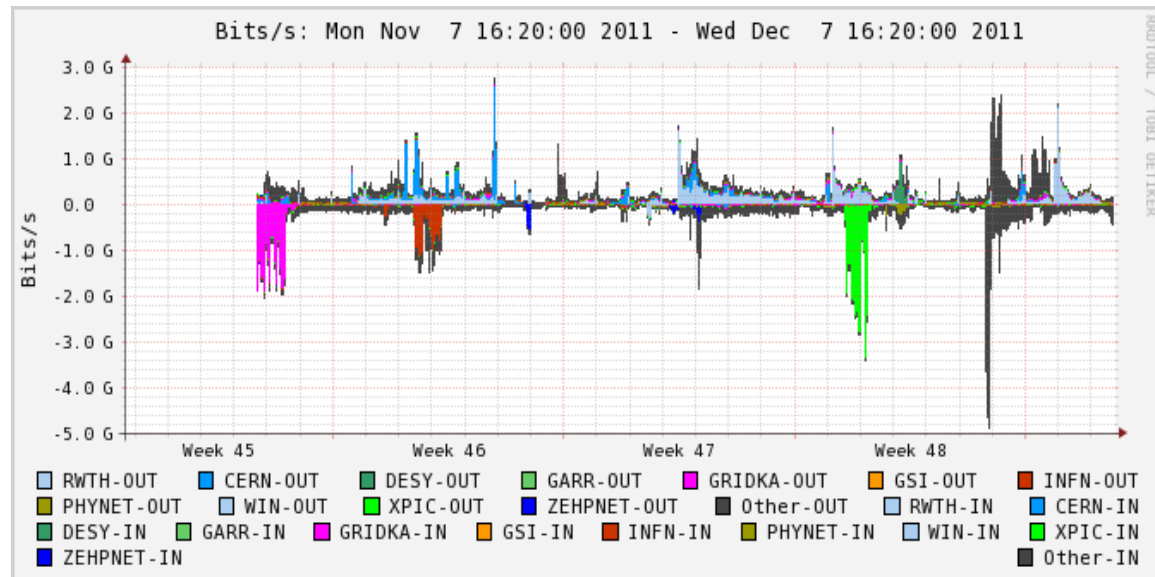
Throughput & Network Perspective



Example DESY:
 high internal data **throughput**
 Similar to T1s like FNAL, GridKa
 NAF dominates access to T2
 CMS data sets

Example RWTH Aachen:
HEPPI activated in November
 Communication flow from DFN
 rather marginal
 Picture still unclear
 still misconfigurations ?
 X-Atlantic traffic ?

RWTH was on 20 Gbit/s already



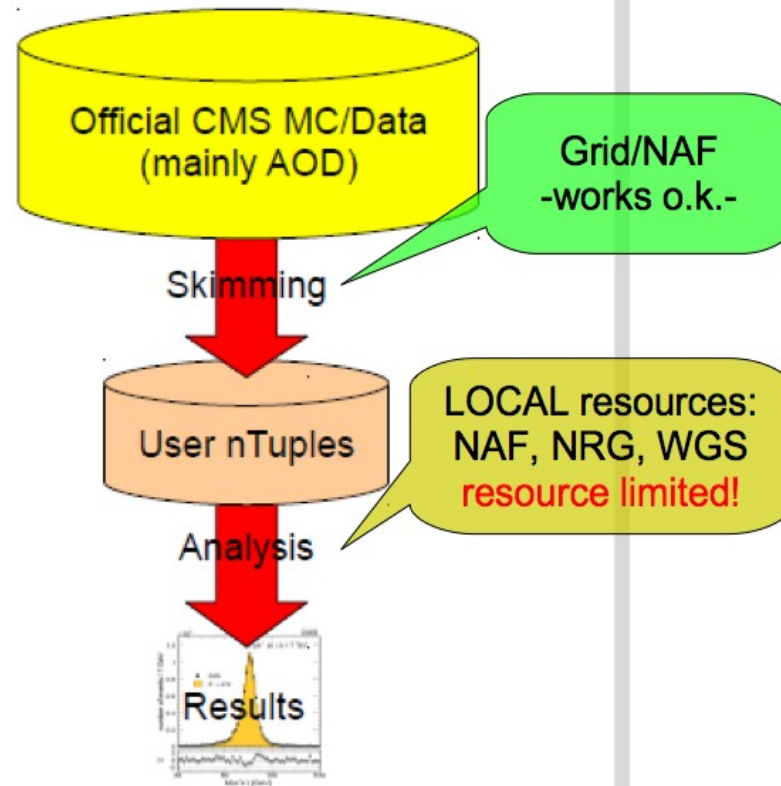
User Analysis Workflow



FSP-CMS User Feedback Typical Workflows



- Data Analysis:
 - Skimming:
 - Gather needed collisions events from official CMS datasets within the GRID
 - Write to private nTuples per Users/Group and copy them to analysis place
 - I/O intensive
 - Analyse:
 - Analyse nTuples
 - CPU + I/O
- Toy MC studies:
 - CPU!!!!!!



Resource Perspectives for 2012

WLCG CMS Tier-2 pledges for 2012:

7.5% of total CMS T2 request

DESY: 1350 TB, 14750 HS06

Aachen: 600 TB, 8875 HS06

we stay with the 2:1 commitment

To be in place already and/or in January/April'12 at the latest

2013 (so far) no T2 pledge increase request from CMS

But (especially at AC), a large fraction of old hardware has to be replaced!

Very substantial hardware upgrade at RWTH Aachen this September:

- new CPU & disk equipment:

345 k€ HGF Terascale + 109 k€ DFG

+900 cores, +850 TB (2TB-SAS) disks

Luckily transacted before the Thailand flood crisis

CPU available since October, new disk setup is in progress

Remaining 30 k€ from the 5a-HGF Terascale fund to be spent in 2012

Replacements of broken equipment, 10 Gbit firewall (2008 D-Grid

Sondermittel) will cost enormous money for maintenance from Q2/2012

Resource Perspectives for 2012

Table: Christoph Wissing, Sep.26th
T2 pledges now slightly changed

Site	CPU (HS06) ^k		Disk (TB)	
	2011	2012	2011	2012
KIT T1	15	15	1950	2200
KIT "T3"	4	4	120	220
DESY T2	11.8	15	640	1300
DESY+UHH "T3"	4.8	5	230+170	230+170
RWTH T2	6.6	8	330	600
RWTH "T3"	9	15	190	250
NAF+UHH	4.8+4	10.5+9.5	60+25(Lustre)	75+25

User data at DESY and (from Jan'12) Aachen Tier-2s mirrored
(due to bad experiences with complete pool / raid controller losses)

For 2012 -in parallel to significant and suitable Tier-2 resource pledges-
KA, AC and DESY **together will be able to provide substantial extra resources to support German analysis users to stay competitive !**

We intent to **continue a close cooperation** of all three (AC,DESY,KA)
sites in common projects, user support, coordination, ...

Resource Perspectives Beyond 2012

Although 2013/14 no LHC beam, T2 hardware replacements (rule of thumb: 20-25%/y) and even upgrades (MC preparation for 14 TeV running, ...) will become necessary

DESY surely intends to continue as one of the major CMS Tier-2 players

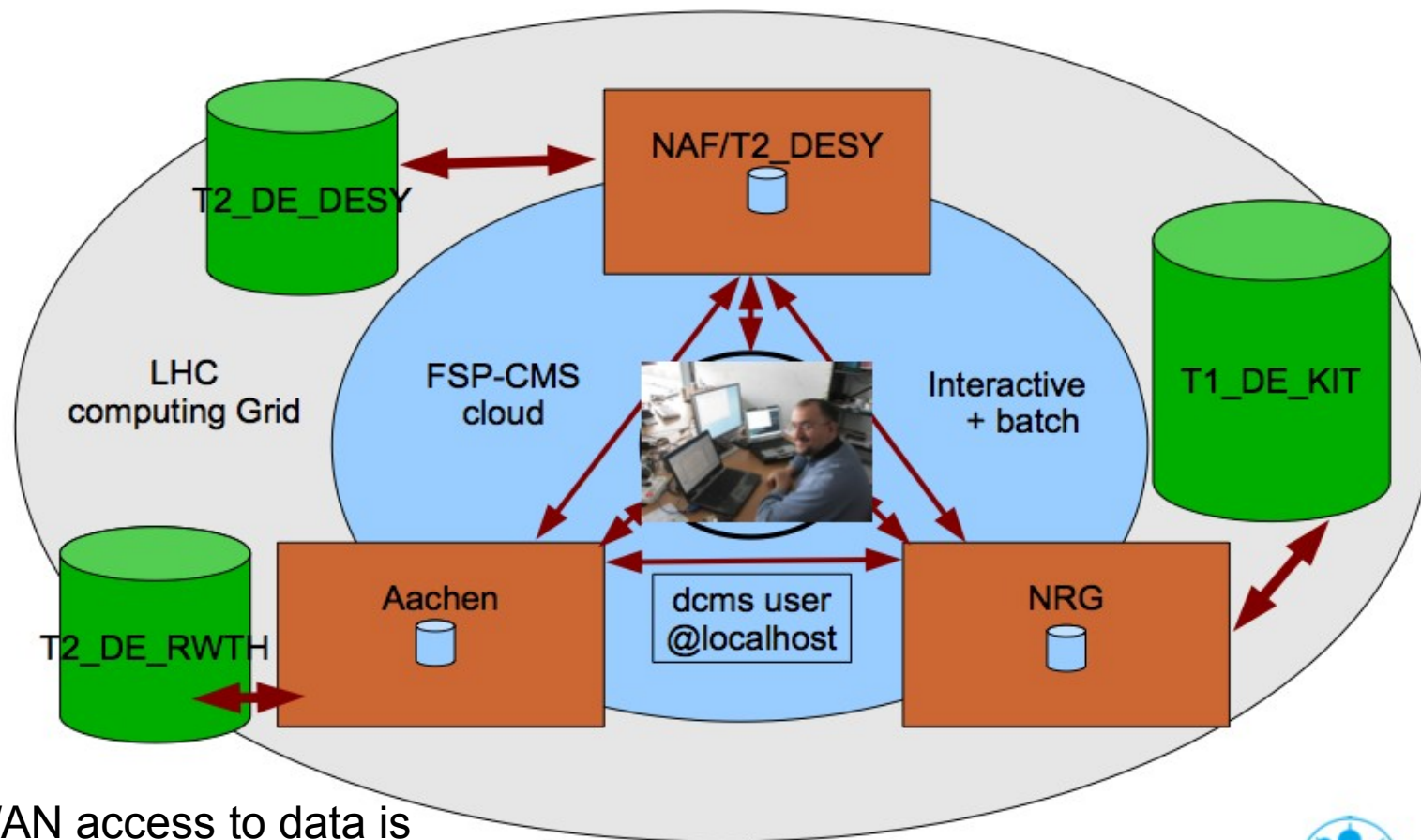
DESY alone will not be able to provide the full German T2 share for CMS

Central and continuous funding of also the University Tier-2s is absolutely essential, but especially hardware part is not yet settled

Have to provide financing that our HGF Grid project experts do not leave
We aim for at least 0.5 FTE / site during HGF Terascale bridging period

Good hope that also during forthcoming 3y-funding period the BMBF continues to provide manpower for LHC experiments' T1 & T2 computing duties

Vision for the Future: Single Sign On User Center Computing



WAN access to data is well advanced in CMS

Christoph Wissing | FSP-CMS Meeting 2011 | Page 14



Use GlideinWMS concept