Forschungszentrum Karlsruhe
in der Helmholtz-Gemeinschaft

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CONNECTING WLCG TIER-2 CENTERS TO GRIDKA

DESY Hamburg

	2006	2008
CPU [kSI2k]	800	1600
disk [TB]	200	540
tape [TB]	100	540

DESY builds a federated CMS Tier-2 together with RWTH Aachen. DESY will provide massive storage capacity and does MC production as well as data processing.

University of Wuppertal

	2006	2008
CPUs	≈ 120	depends on
disk	≈ 1TB	available funds.

RWTH Aachen

	begin 2006
CPUs	50
disk[TB]	15

RWTH builds a federated CMS Tier-2 together with DESY. Aachen will do massive MC production and detector calibration.

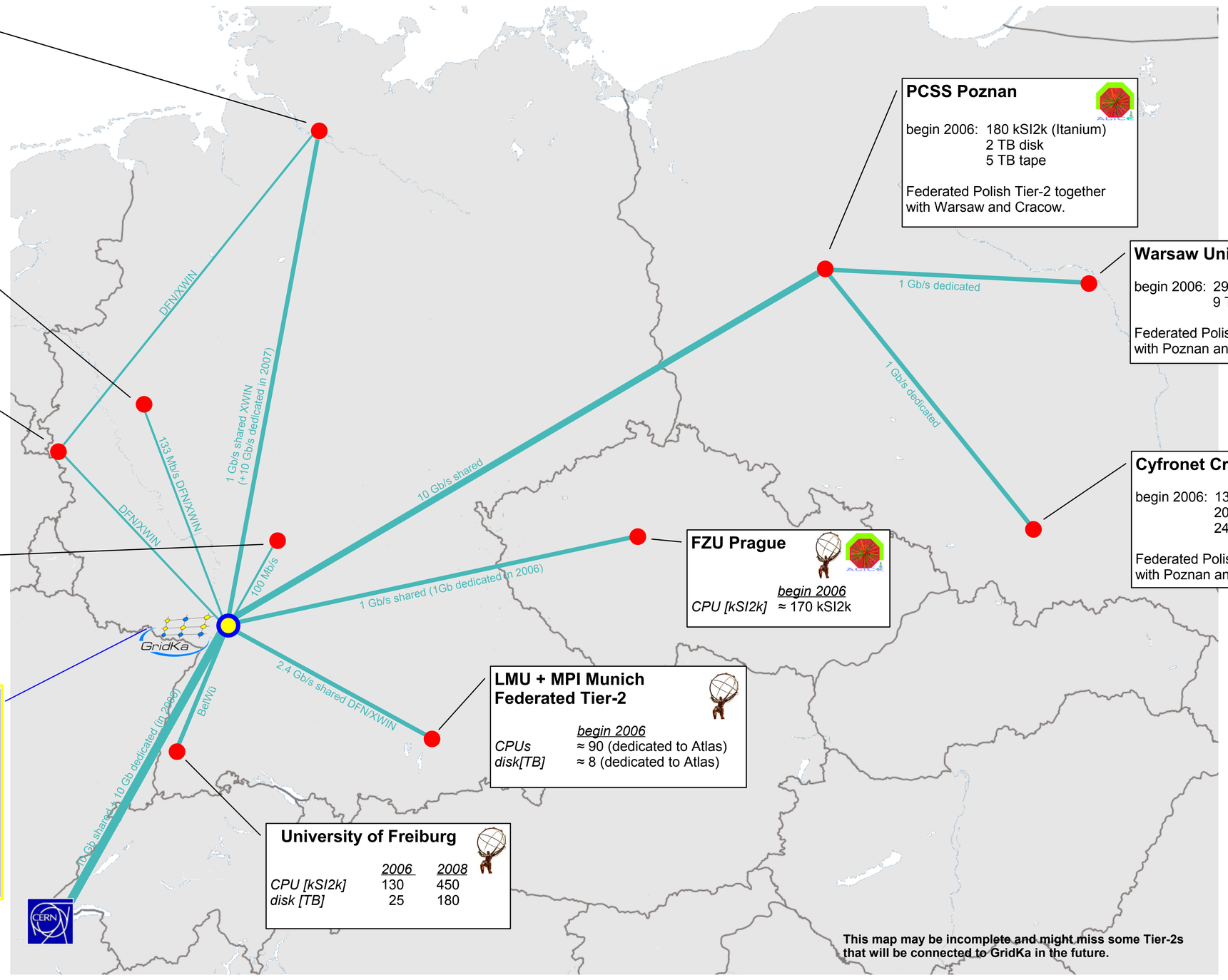
GSI Darmstadt

	2006	2008
CPU [kSI2k]	150	1000
disk [TB]	45	300
tape [TB]	not yet decided	

GridKa Tier-1 @ Forschungszentrum Karlsruhe

	2006	2008
CPU [kSI2k]	2020	8300
disk [TB]	640	3860
tape [TB]	960	4460

GridKa supports all four LHC experiments as well as currently several non-LHC experiments.
(Numbers include non-LHC resources.)



Technical and organizational aspects of connecting Tier-2 sites to the GridKa Tier-1

(**Facts, prerequisites** and **necessary steps**)

Security

- Router ACLs to restrict the access to srm and gridftp hosts to corresponding hosts of the Tier-2 site.
- Firewall not possible for performance reasons.

→ ACLs have to be modified to allow file transfers to and from Tier-2 sites.

Tier-1 and Tier-2 collaboration

→ Establish communication between site admins.
→ Setup mailing list for announcements and other communication.
→ Clarify responsibilities for different services involved.
→ Make use of a bug / task tracking system.

Certification of the Tier-2 LCG site

- The ROC (Regional Operations Centre) for the German/Swiss region is managed by GridKa.

→ The ROC manager, as part of the GridKa team, is responsible for the certification of new Tier-2 sites in Germany and Switzerland as EGEE resource centres.

More information on this topic is presented at CHEP06 by Dr. Sven Hermann: “Operating a Tier1 centre as part of a grid environment” (Poster presentation)
See also:
https://cic.in2p3.fr/index.php?id=rc&subid=rc_config&js_status=2

File Transfer Service (FTS)

- FTS schedules and performs file transfers between different sites.
- It allows to have an individual set of transfer parameters (e.g. # of parallel file transfers, # of streams) for each site and direction.
- The available bandwidth can be shared between several VOs. The individual VO share can be adjusted.
- Access to the server for users and administrators is controlled by ACLs.

→ Create FTS channels and configure ACLs.
→ Optimize transfer parameters with respect to the WAN connection and the mass storage system of the Tier-2 site.

Network

- The wide area network (WAN) connection to each Tier-2 has to provide the necessary bandwidth to/from each of the Tier-2 sites.
- At the Tier-1 side, it has to be ensured, that Tier-0 ↔Tier-1 transfer rates are not influenced by Tier-2 ↔ Tier-1 transfers.

→ Setup dedicated or shared WAN connections between Tier-1 and the Tier-2 sites, considering the size (e.g. # of CPUs) of the particular sites and the supported experiments.

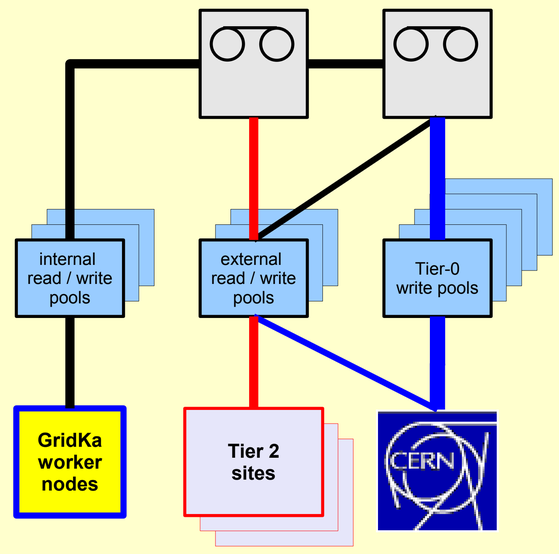
More details on networks are presented at CHEP06 by Bruno Hoeft: “LHC-OPN Network at GridKa -- incl. 10Gbit LAN/WAN evaluations” (Poster presentation)

Storage system (dCache)

- The disk / tape storage system has to be designed for simultaneous write access from the Tier-0 and read/write access from Tier-1 and Tier-2 sites as well as internal read / write access.
- Tier-2 ↔ Tier-1 transfers must not interfere with Tier-0 ↔ Tier-1 transfers.
- Approximate transfer rates from and to Tier-2 sites:

	T1 → T2	T2 → T1
Atlas	20-40 MB/s	small (<20 MB/s ?)
CMS	60 MB/s	10-15 MB/s
Alice	1 MB/s	75 MB/s

→ Subdivide storage system for Tier-0, Tier-1/2 and internal access.

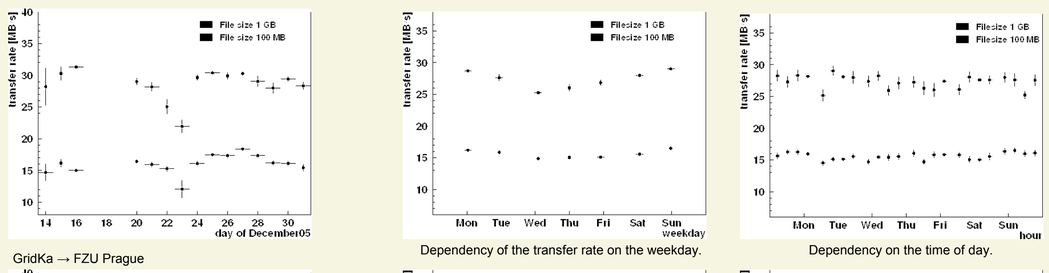


Picture shows a simplified view of the GridKa dCache setup.
A more detailed view is presented at CHEP06 by Dr. D. Ressmann: “Using TSM to create a high-performance tape connection.” Session CFN-1 (Monday Feb. 13th, 14.20 - 14.40)

File transfer tests between GridKa and Tier-2 centres

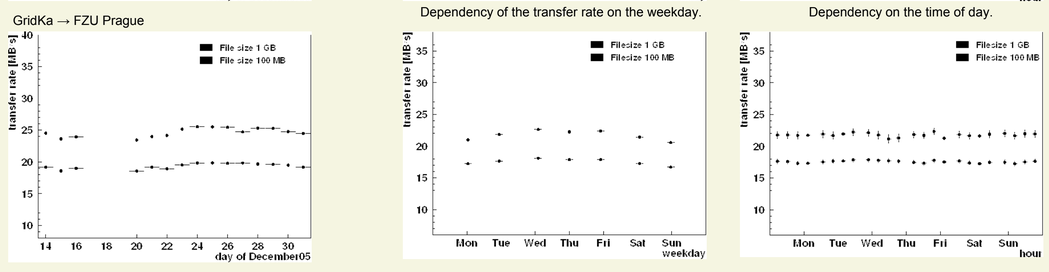
Gridftp transfers of single files using 10 streams to one gridftp-server at the destination side. The quoted transfer rates thus do not necessarily indicate the maximum possible transfer rates over the particular network link.

GridKa → DESY



Dependency of the transfer rate on the weekday. Dependency on the time of day.

GridKa → FZU Prague



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