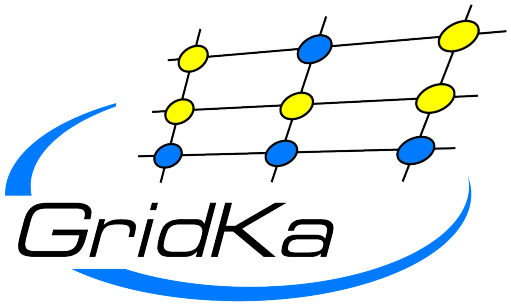
Karlsruher Institut für Technologie

KIT Site Report

Andreas Petzold

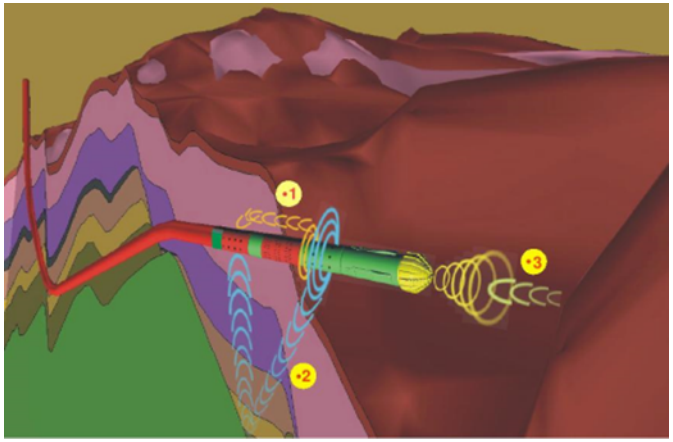
STEINBUCH CENTRE FOR COMPUTING - SCC

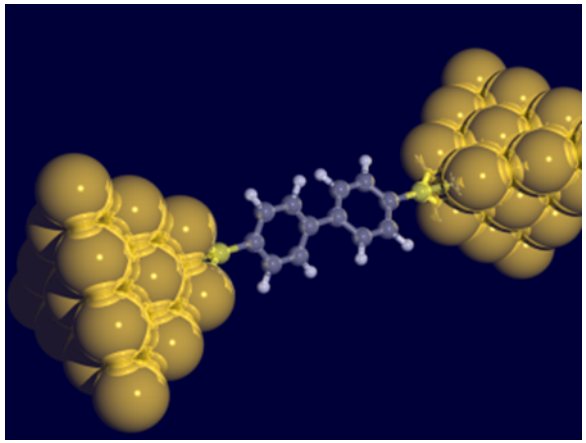
Data Intensive Science at KIT

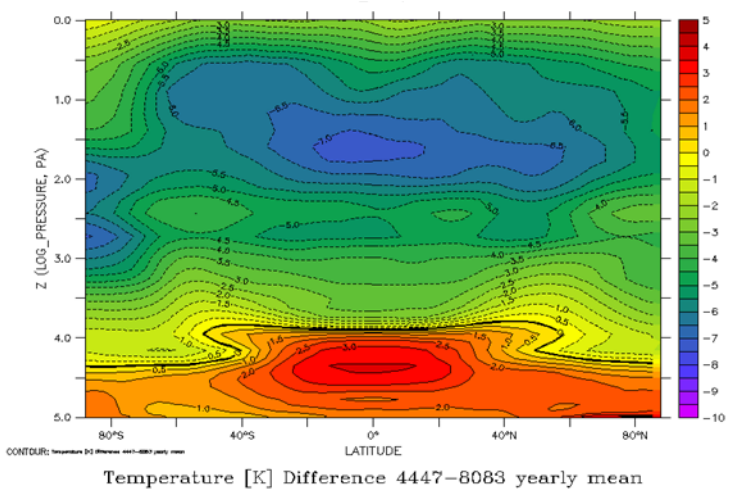


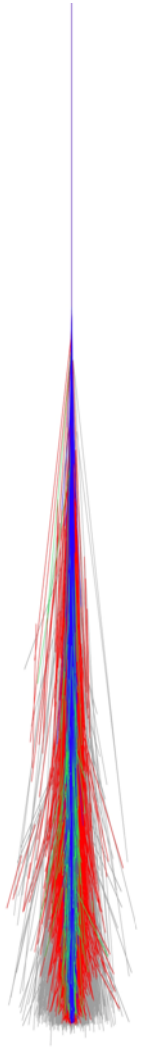
Computational Science and Engineering at KIT

- 4 HPC machines for local, state wide, nation wide use



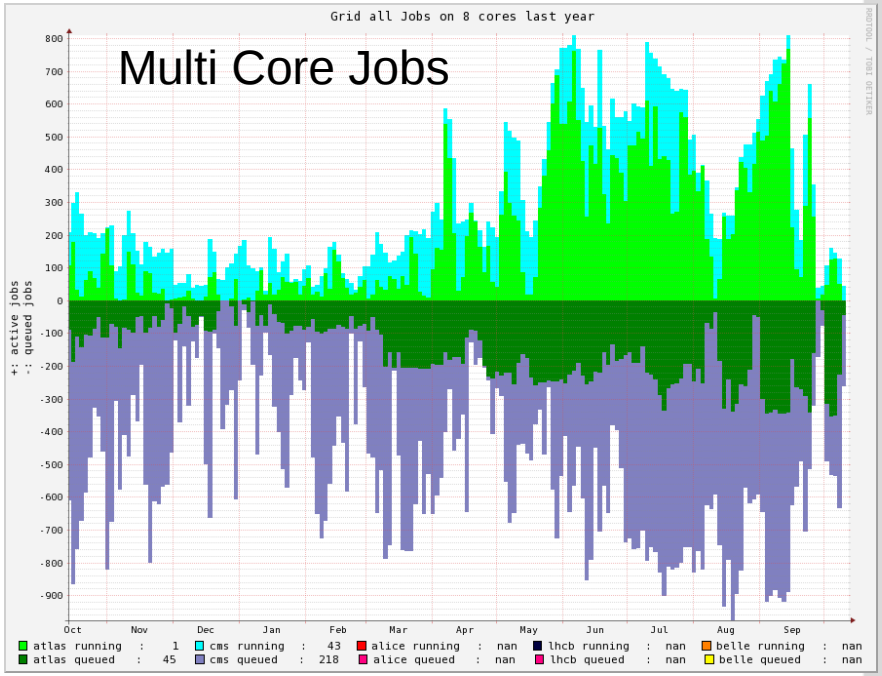






Tier-1 Batch System & Farm

- 180kHS06
- 154 new WNs in production since two weeks
  - Dual Intel Xeon E5-2630v3 (8-Core, 2.40GHz), 96 GB RAM, 3x500 GB HDD
  - 24 job slots/node, 4GB RAM/slot
- UGE with cgroups
  - Don't let UGE kill jobs, but let cgroups do their job!
- Machine Job Features
  - fully implemented
- KIT participation
  - HEPiX Benchmarking WG, WLCG Multicore TF, WLCG Machine Job Features TF



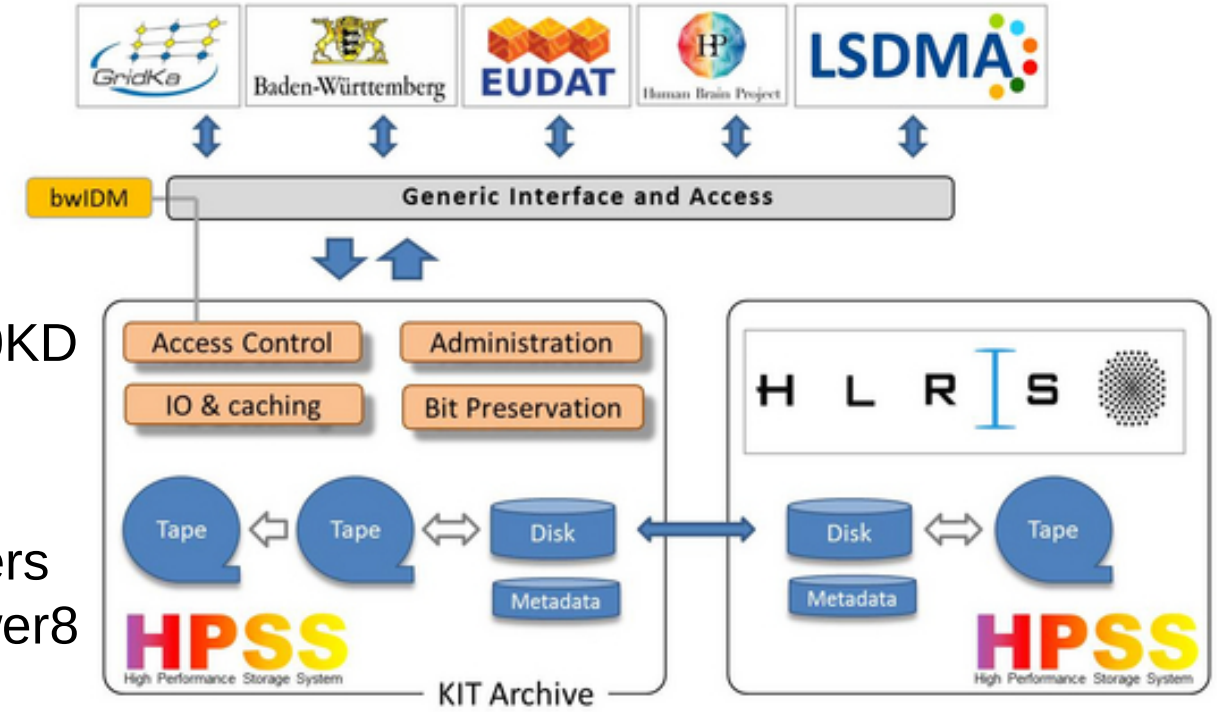
Tier-1 Disk Storage & dCache/xrootd

- 14PB disk storage
  - currently all DDN S2A9900, SFA10K, SFA12K
- 2.4PB extension for 2015 delayed but in pipeline
- 3.2PB replacement scheduled for 2016

- 6 dCache instances
  - ATLAS, CMS, LHCb, shared including Belle II, national resources, testing
  - recently updated to 2.13
  - new DB hosts added
- xrootd for ALICE
  - disk-only & tape SE updated to 4.1.3

Tape Storage

- Tier-1 TSM
  - 19PB, 3 libraries, library visualization ERMM
  - recently switched to T10K technology
  - simplified setup improved reliability
- LSDF TSM
  - 6PB, 1 library
- HPSS
  - 1 library, currently only T10KD
  - Testing migration for Tier-1&LSDF
  - Talk at HPSS Users Forum about Power8 performance



Config Management and Deployment

- pushing hard to puppetize as many things as possible
- gitlab & gitlab-ci (shared), foreman, puppet masters (separate per project)
- SDIL completely puppetized via RedHat Satellite
  - connected to gitlab
  - manages x86, Power8 BE, Power8 LE (not supported by RH) machines
  - AIX??
- many more details in Dimitri Nilsen's talk on Friday

ELK

- many ideas but limited manpower
- existing ELK prototype for dCache, UGE
- LSDF
  - file (access) statistics
    >400M files, txt name space dump >100GB
  - ELK handles the data of a single dump easily, now need to implement history

HPC – New ForHLR II

- Compute: Transtec
  - 23040 cores (1152 nodes)
  - Lenovo NeXtScale nx360 M5 Server
  - Dual Intel Xeon Haswell E5-2660v3, 2,6 GHz, 10 Core
  - 64 GB RAM DDR4, 480 GB SSD
  - Mellanox InfiniBand HCA FDR 56 Gbit/s
- Storage: DELL
  - DDN storage systems
  - 3 Lustre file systems
    /home 611TiB@11GB/s; /work1 1222TiB@22GB/s; /work2 3055TiB@55GB/s
- New building
  - Offices
  - Visualization lab

Last year

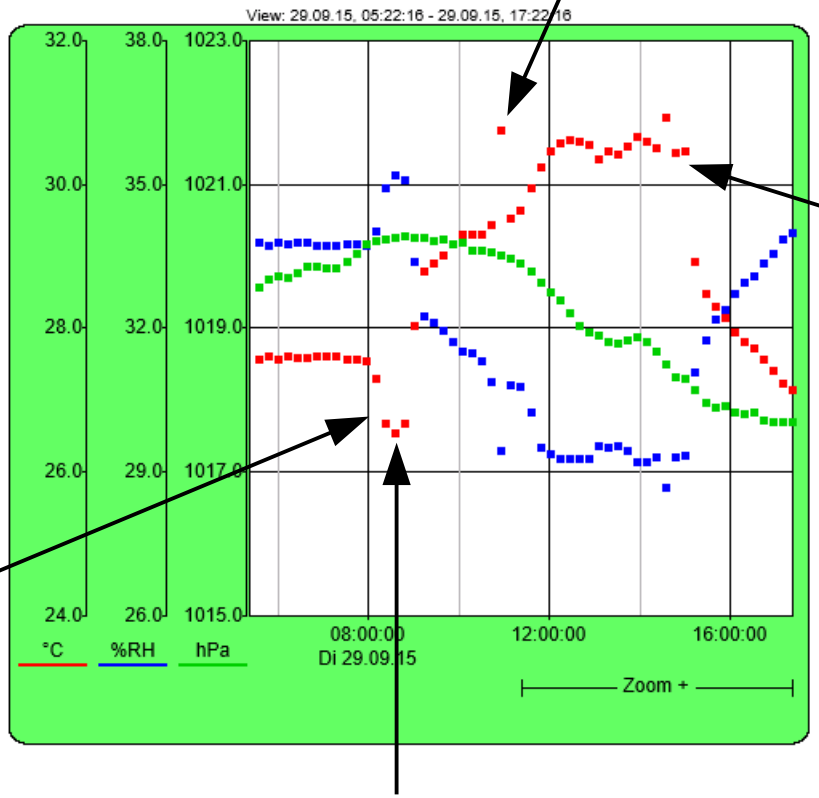
This week

Central Cooling at KIT Campus North

- new combined heat/power/cooling plant at KIT CN
  - cooling line on campus will replace many small cooling installations across campus
  - base load provided by SCC: max 2.4MW
- existing cooling installation needs to be cut open to attach central cooling line
- Can we keep at least all disks running during work on cooling?
- recent maintenance downtime used for testing
  - bypass with external cold water supplied
  - increased capacity of air cooling in one room
  - test successful, with a few lessons learned

Cooling Bypass Test

Temp run-away – caught by opening additional floor plates

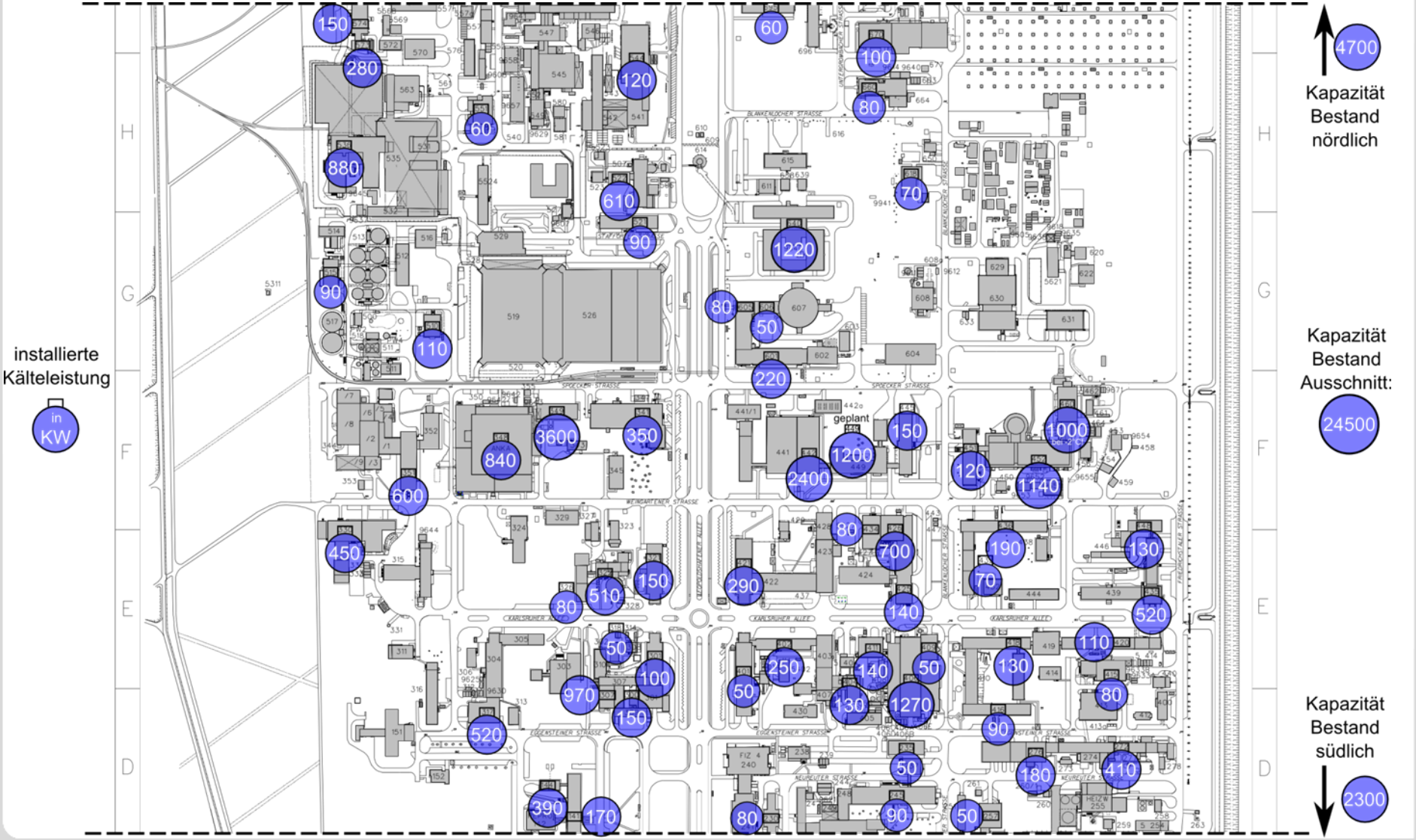


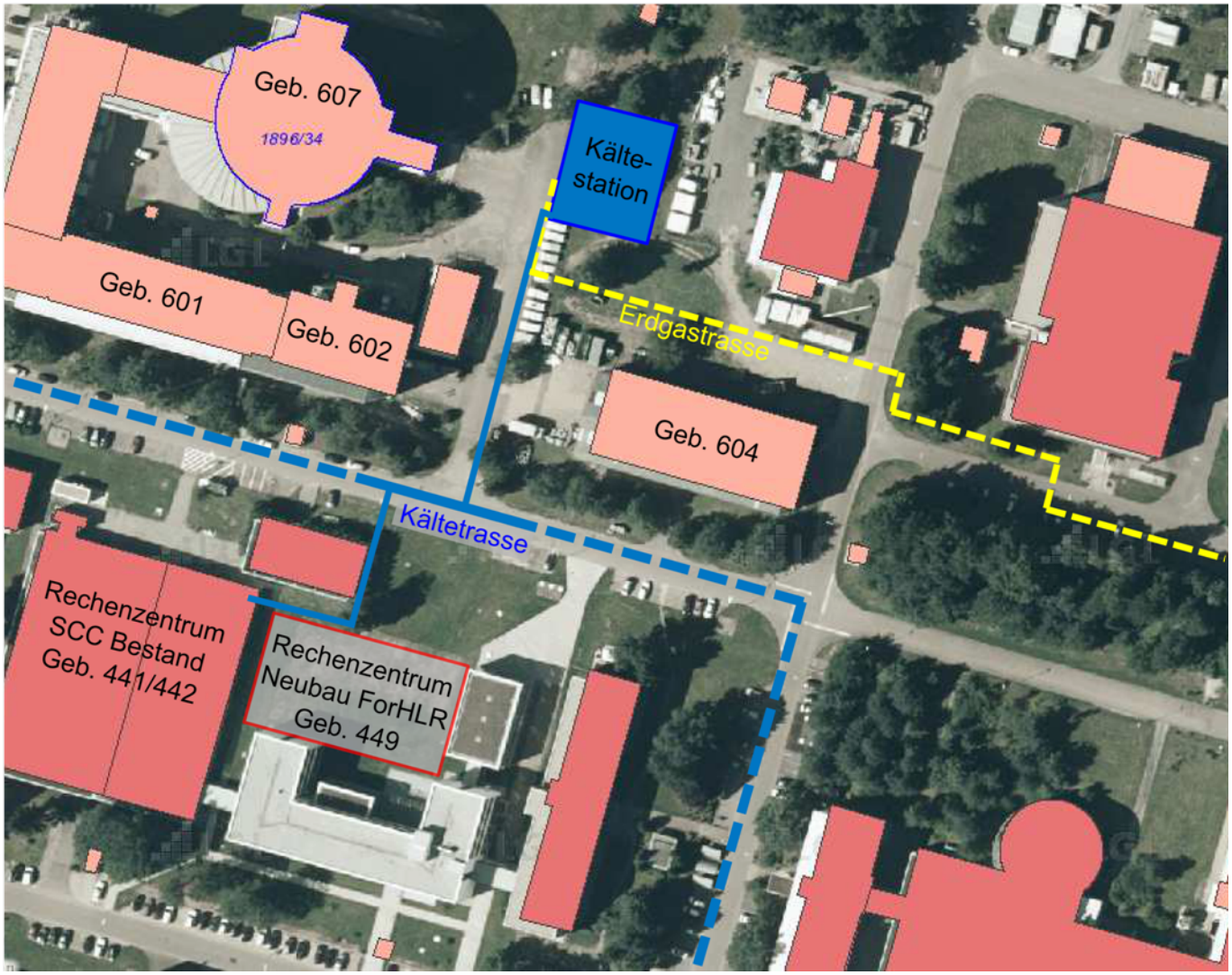
water cooling switched on again

Additional air cooling switched on

water cooling switched off, racks opened

Central Cooling at KIT Campus North

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Erdgastrasse
Geb. 604
Kältetrasse
Rechenzentrum
SCC Bestand
Geb. 441/442
Rechenzentrum
Neubau ForHLR
Geb. 449

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Thank you!