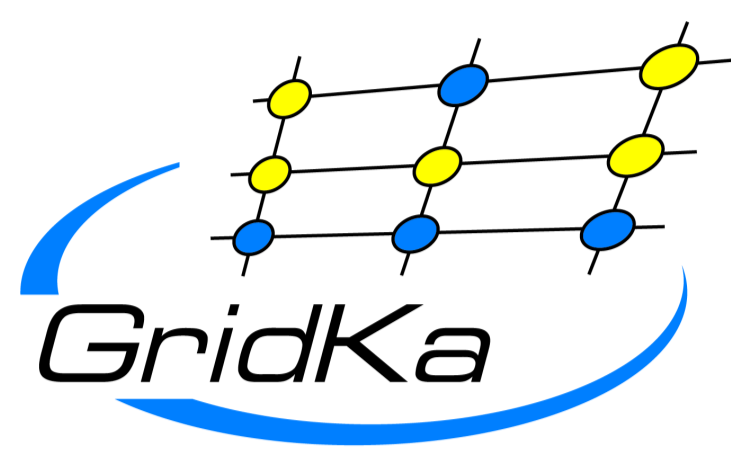# Forschungszentrum Karlsruhe
in der Helmholtz-Gemeinschaft

Forschungszentrum Karlsruhe GmbH, Institute for Scientific Computing,
Postfach 36 40, 76021 Karlsruhe

Doris Ressmann, Stephanie Böhringer, Silke Halstenberg, Jos van Wezel

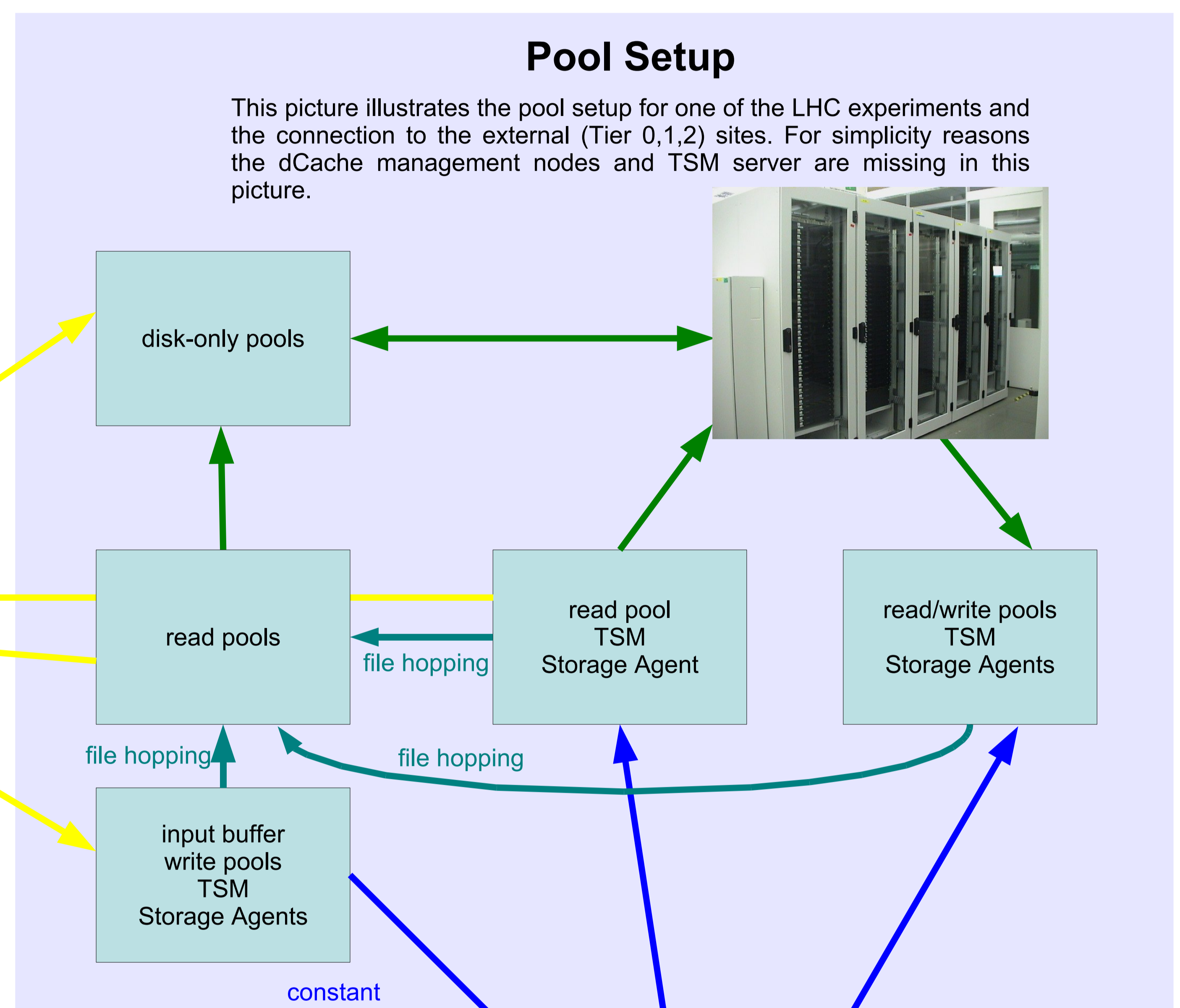# Data storage layout and architecture of the German T1

dCache storage area
866 TB storage on 233 dCache pools

xLHCe	**ATLAS**	**BaBar**		**CMS**	**COMPASS**	**D0**	**LHCb**	**DTEAM / OPS / DECH**	**D-GRID**
48 Pools 48 TB T0D1 155 TB Tape connected	53 Pools 127 TB T0D1 91 TB Tape connected	no dCache Pools	13 Pools 12 TB Tape connected	62 Pools 16 TB T0D1 286 TB Tape connectedc	13 Pools 17 TB Tape connected	no dCache Pools	26 Pools 51 TB T0D1 6 TB Tape connected	16 Pools 8 TB T0D1 14 TB Tape connected	2 Pools 30 TB Tape connected

GridKa Data Management

At GridKa we have different types of storage areas.
• the classic storage element accessible only from the private network, using NFS mounted GPFS file-systems and access via xrootd
• production dCache version 1.7
  • accessible worldwide via LCG-GFAL, FTS, SRM v1, gridftp
  • accessible from the private network via dcap, xrootd, gridftp, SRM v1
• preproduction dCache version 1.8 This installation is for testing all new SRM 2.2 features, to be ready to install the new dCache version in production as soon as a stable dCache 1.8 version has been released.
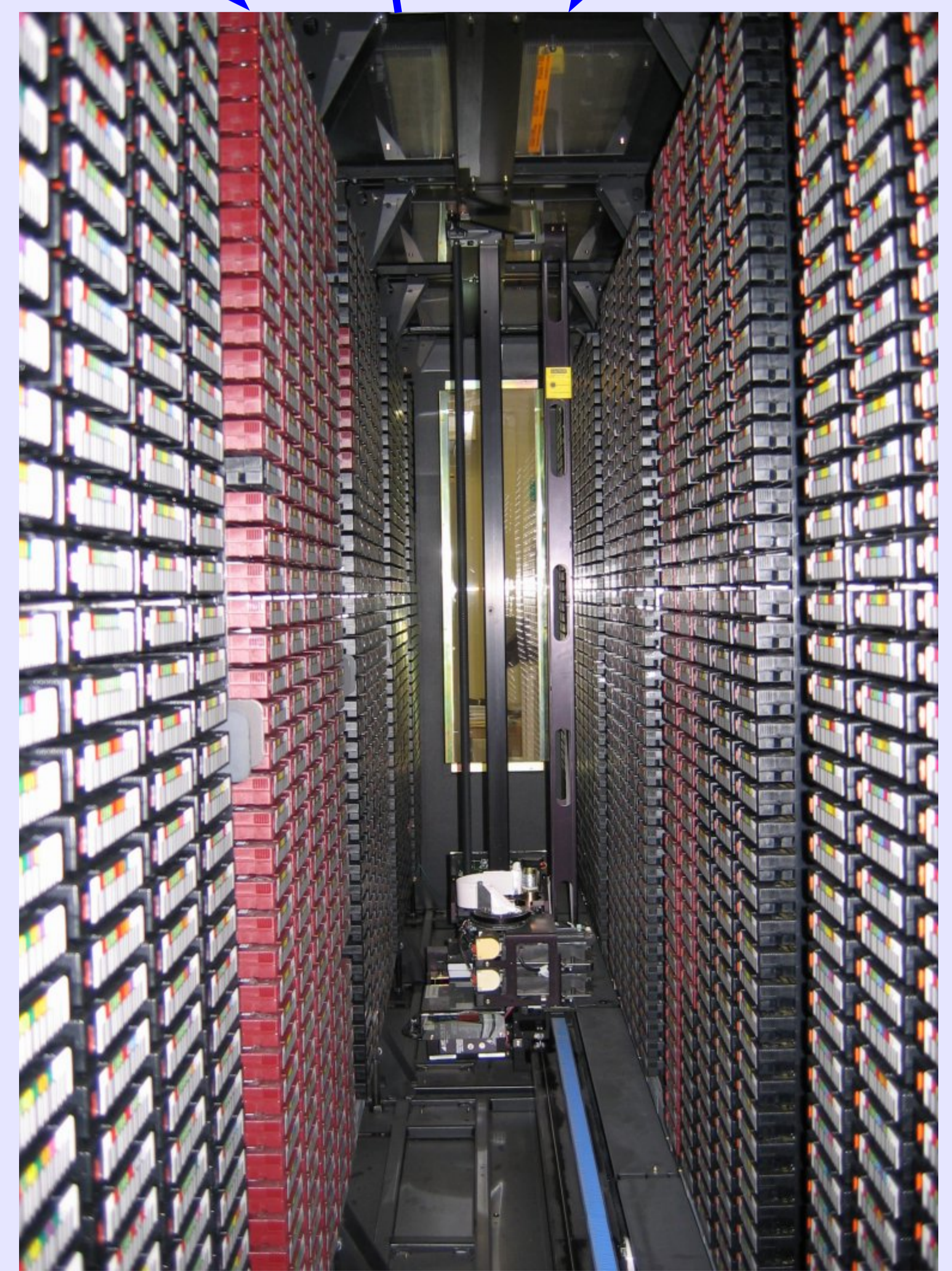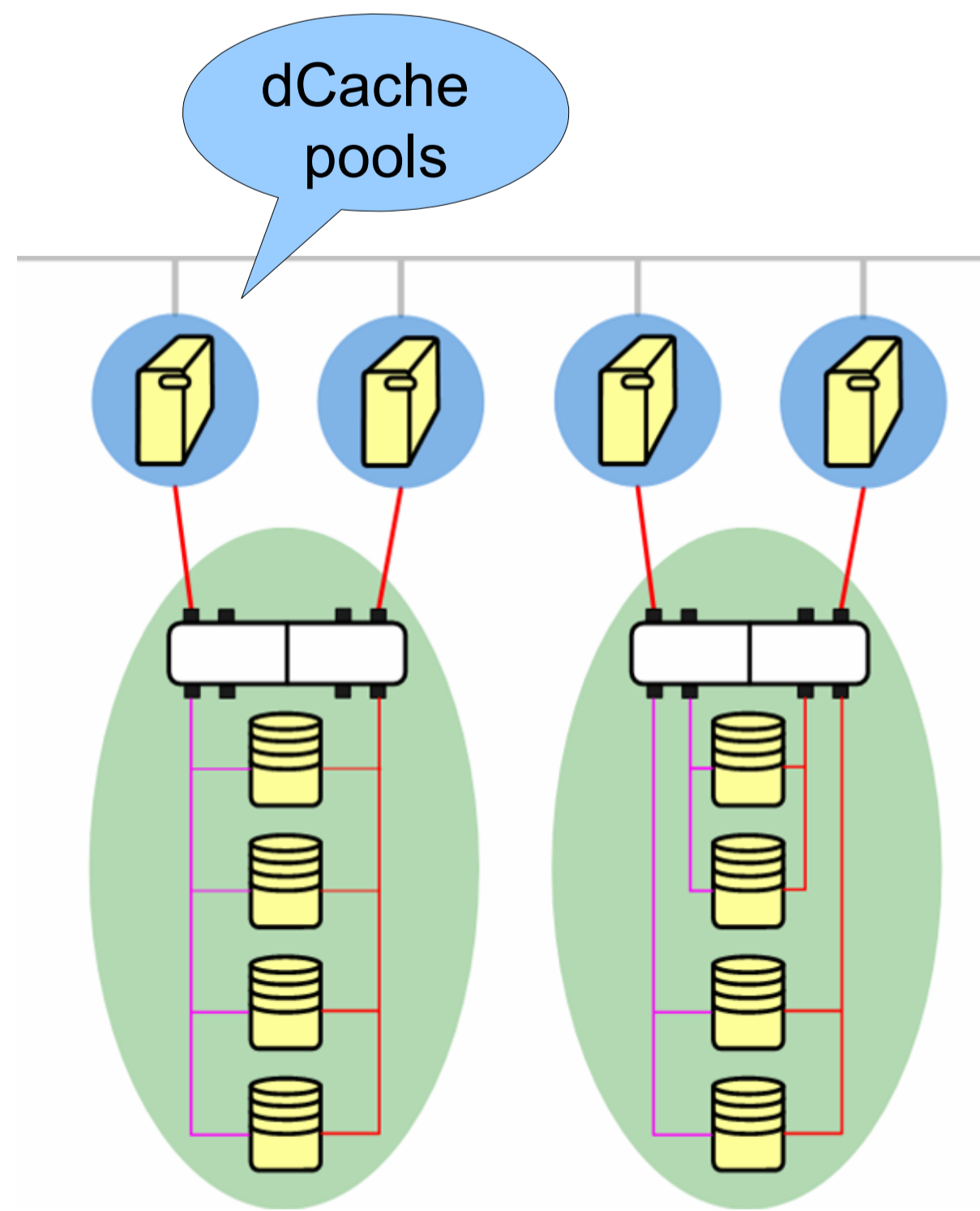
dCache Management

dCacheh1
2x2.8GHz   2.5 GB mem
31GB disk SL4 kernel: 2.6.9-34
dcap
dirDomain
utilityDomain
lmDomain
dCacheDomain
Admin-door
httpdDomain
StatisticDomain
xrootdDomain
gPlazma

gridka-dCache.fzk.de
1x1.9GHz   4GB mem
172GB system 92 GB dB
SL-CERN kernel: 2.6.9-42
gLite-SE
srmDomain
InfoProvider
SRM Postgres DB

F01-015-111
1x3GHz   4GB mem
32GB disk mirror
135GB dB SL4
Kernel:2.6.9-34
pnfsServer
Postgres DB
pnfsManager
Companion DB

F01-015-103
Billing DB
SRM Watch

dCache 1.8 in pre production

• SRM 2.2
• limited VO support in pre production
  • OPS, DTEAM, ATLAS, CMS, LHCb
• Tape connection
  • dedicated TSM server
  • testing new Tape library
  • testing our dCache – TSM connection
• gPlazma authentication
  • different roles e.g. for space reservation
• separation of SE and SRM node
  • SE on a small virtual machine

Pool Setup

This picture illustrates the pool setup for one of the LHC experiments and the connection to the external (Tier 0,1,2) sites. For simplicity reasons the dCache management nodes and TSM server are missing in this picture.

CERN Tier0/1/2

disk-only pools

read pools

read pool TSM Storage Agent

read/write pools TSM Storage Agents

file hopping

input buffer write pools TSM Storage Agents

file hopping

file hopping

constant stream

dCache Fileserver

Always two dCache file server have access to the same disk area, as such if one file server crashes, it is straight forward for the second to start the pools of the failed machine.

dCache pools

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