



THE dCACHE STORAGE ELEMENT

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ABOUT

- Introduction
- The dCache German Support Group
- dCache core development
- dCache Physics analysis support and tuning



PRELIMINARY INFORMATION ON DCACHE

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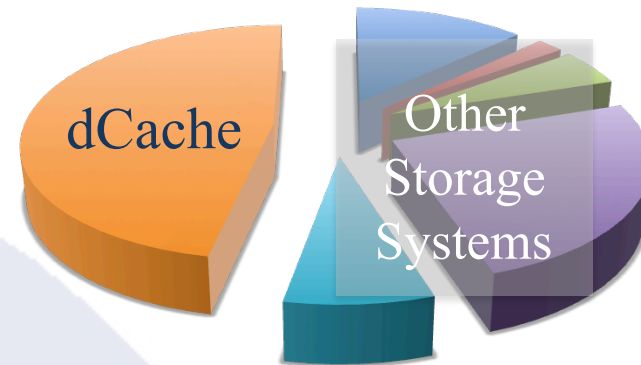
- International project. Contributions and funding by
 - DESY, NDGF (Nordics), FERMIlab (US)
 - EMI (Europe), DGI , Alliance
 - Headquarters : DESY
 - About 11 developers and support people in total, plus German support team
- Professional quality management
 - Continuous mandatory code reviews
 - Large automated testing infrastructure
- Customer management
 - Professional ticket system
 - Weekly Tier I support meeting
 - German Support group
 - Annual customer workshops



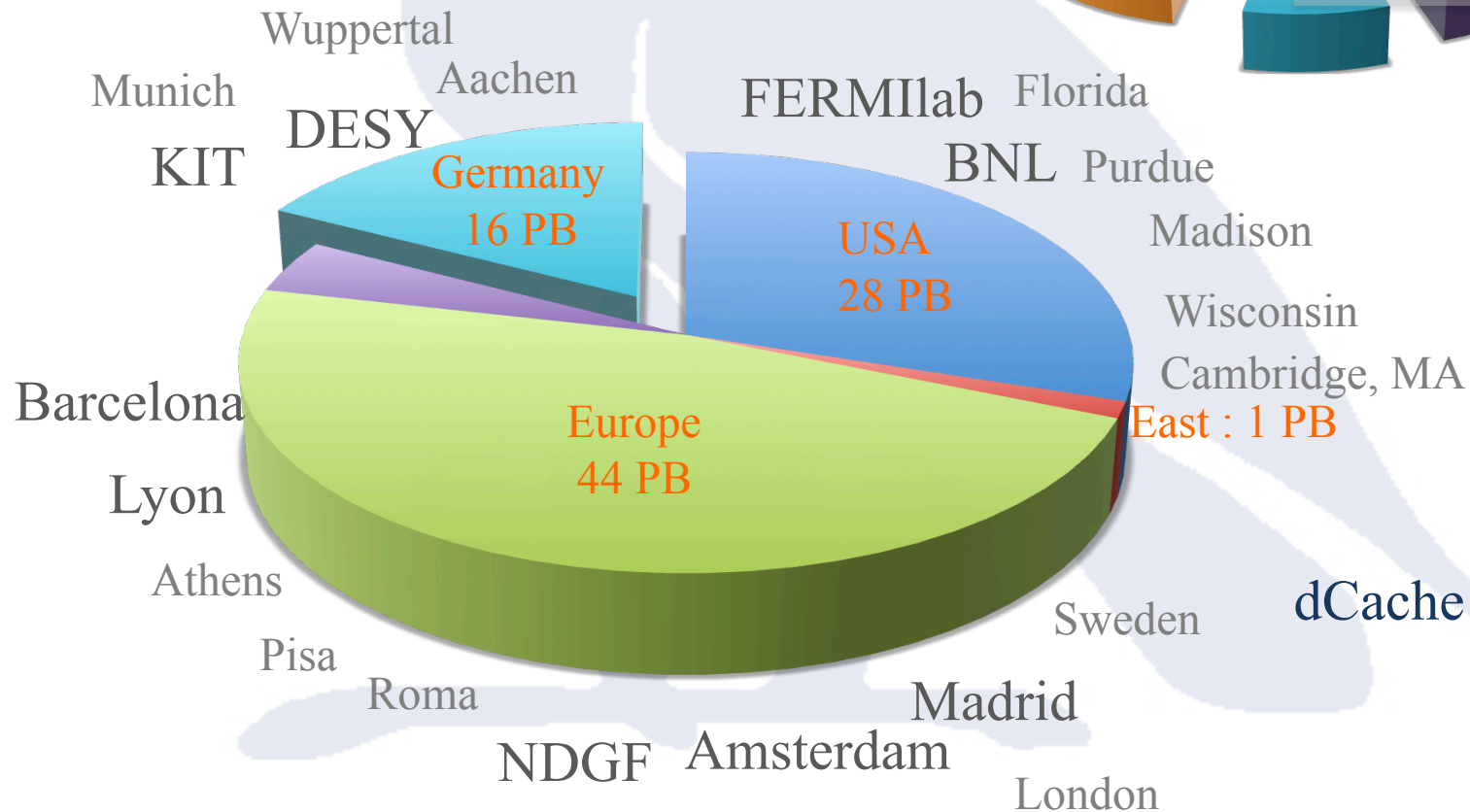
PRELIMINARY INFORMATION ON DCACHE

- 94 PB in total
- 7 Tier I's
- 40 Tier II's

WLCG STORAGE PER SE TYPE



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German Support Group :

- Composed of
 - HGF Alliance sites
 - D-Grid Integration Project (DGI I/II)
 - Voluntary Sites
- Activities
 - Bi-weekly phone conferences
 - Review of dCache.org documentation
 - Organization of annual dCache workshop and “Storage Sessions” at the *GridKa School of Computing*
 - Incident management (for German dCache sites)
 - Early adaptors of ‘new dCache releases’
 - Evaluation and early integration of new technologies (e.g. NFS4.1/pNFS or WebDAV)



THE DCACHE GERMAN SUPPORT GROUP

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- Advantages
 - Similar to US (OSG) and UK (gridPP) example
 - Natural multiplication of storage knowledge
 - Fast support in case of urgent problems
 - Fast knowledge transfer for new storage sys-admins
 - Faster stabilization of dCache system due to early adoption of brand new releases.
 - Exchange of tuning hints for special cases (e.g. Analysis)
 - Planned
 - “Holidays/Illness” support for small sites.
 - Remote monitoring



DCACHE CORE DEVELOPMENT

Each software needs continues development. Otherwise the project is dead. In case of dCache :

- Improvements to integrate new technologies
 - Taking advantage of SSD systems. (low latency front-end)
 - Extremely high capacity tape. (high latency backend).
 - Aggregating small files to larger units (better support of backup-only tape)
 - Supporting shared parallel file systems (e.g. GPFS, Lustre) as dCache pool storage nodes.
- Adaption of new storage paradigms (WLCG)
 - Avoid tertiary storage, support different random access classes.
 - Allow Cache-Only Tier III's (small Tier II's)
 - Fetching data from multiple other sites (mash protocols) on demand.
- Attract non HEP communities with standard access mechanisms. Eg. NFS4.1/pNFS, WebDAV...



PHYSICS ANALYSIS SUPPORT AND TUNING

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Supporting Physics Analysis :

- By dCache code improvements
 - Decreasing data access latency.
 - Automated replication and redistribution of data between pools.
 - Optimizing ROOT data access
- By competence center
 - Position within dCache.org with competence in
 - Storage and Data Management
 - WLCG Experiment (CMS, Atlas) analysis.
 - ROOT framework.