dCache

Paul Millar

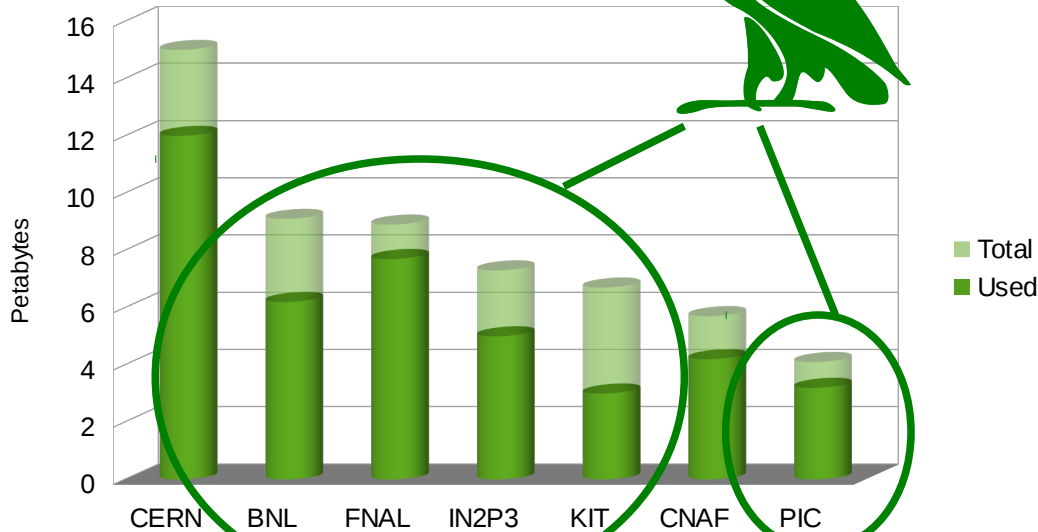# Overview

- What is dCache?
- What's new in the new Golden Release?
- The future

dCache is …

Standards
- ☑ SRM v2.2
- ☑ GridFTP v2
- ☑ NFS v4.1 / pNFS
- ☑ HTTP/WebDAV
- ☑ GLUE 2.0

Petabytes

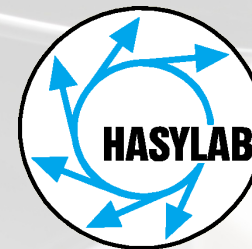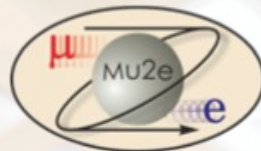| 16 |
| 14 |
| 12 |
| 10 |
| 8 |
| 6 |
| 4 |
| 2 |
| 0 |

CERN BNL FNAL IN2P3 KIT CNAF PIC

■ Total
■ Used

... not just WLCG
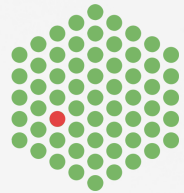
Consultation and support

- GridLab
  - Unique resource
  - Continually evaluating
  - Available for software testing
- The "global redirector"
- SNIC: SweStore
  - National storage facility
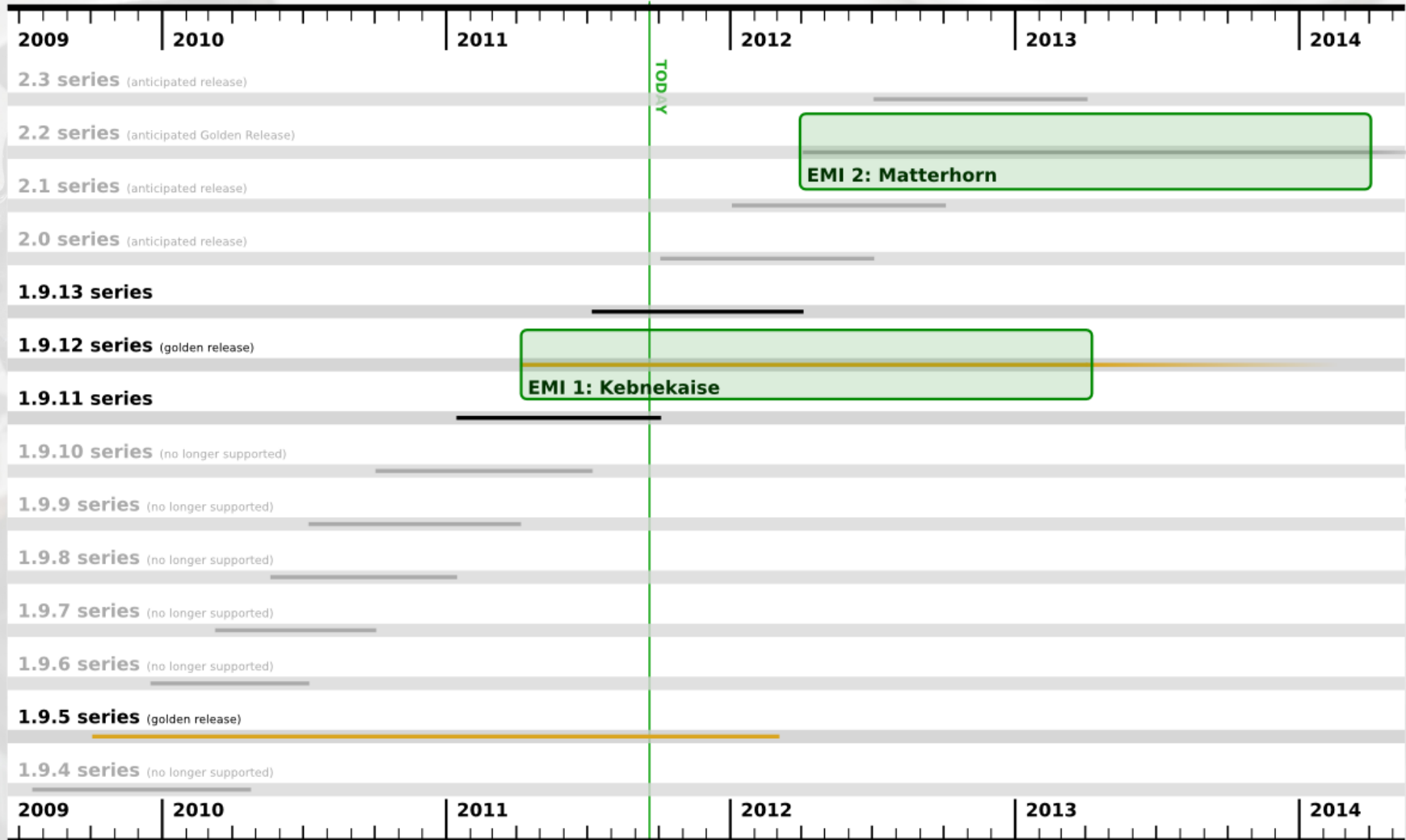 - Federated dCache storage

dCache in EMI and EGI

- Procedure is **understood** and **practised**:
  - Releasing dCache into EMI
  - EMI QA process
  - EMI releasing to EGI's UMG
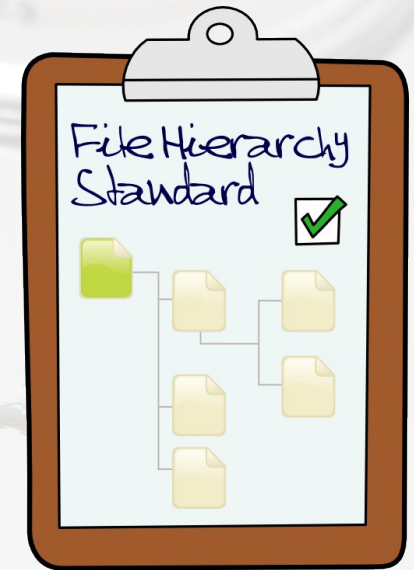 - **Three** dCache sites volunteered for UMD "staged rollout"
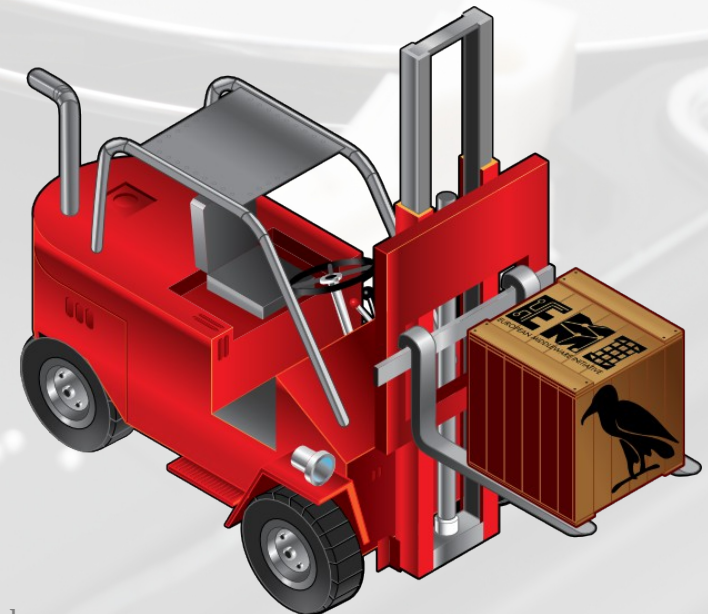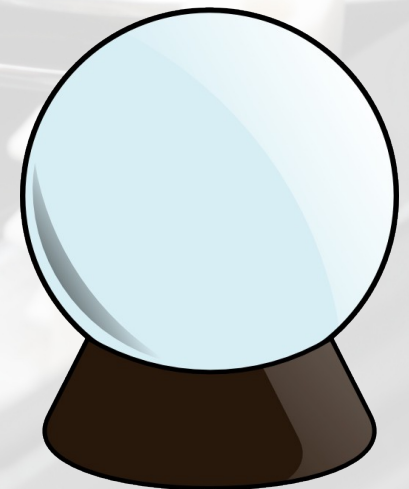
dCache releases

What's in the new Golden Release?

- For sys-admin:
  - New **configuration system**
  - **FHS compliant** builds
  - New pluggable **gPlazma**
    - Comes with support for **Argus**
  - **Data migration** module
- For end-users:
  - WebDAV
  - NFS v4.1 / pNFS

The future

Future: bits and bobs

- Internal features:
  - New pluggable pool selection
- Integration features
- Grid-level features
  - Catalogue synchronisation
- Cloud features
  - EMI working group
  - Already investigating: S3 vs CDMI

Future: abstract pools

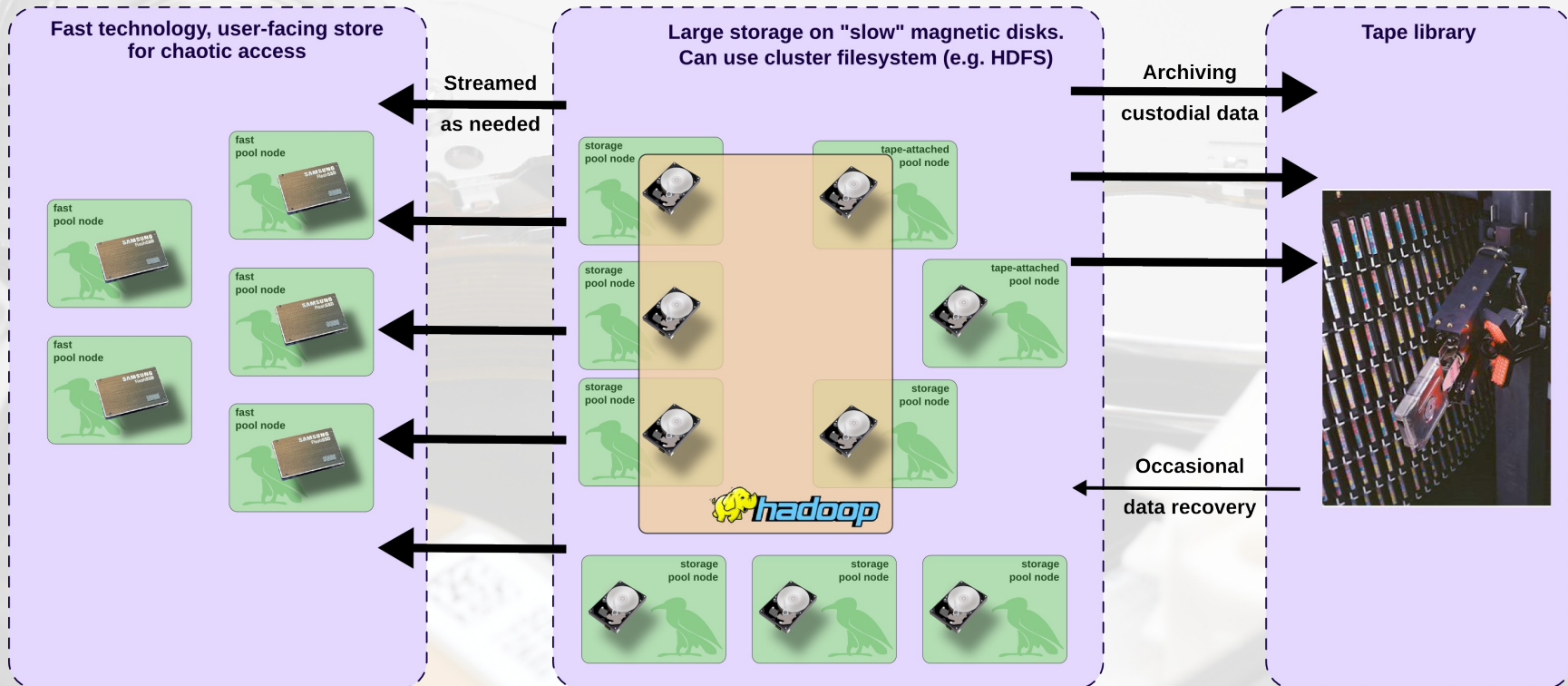## Classic dCache pools:

Data directly accessible via POSIX API

Abstract dCache pools:

Data "somehow" accessible (e.g., POSIX, GPFS, HDFS, ...)
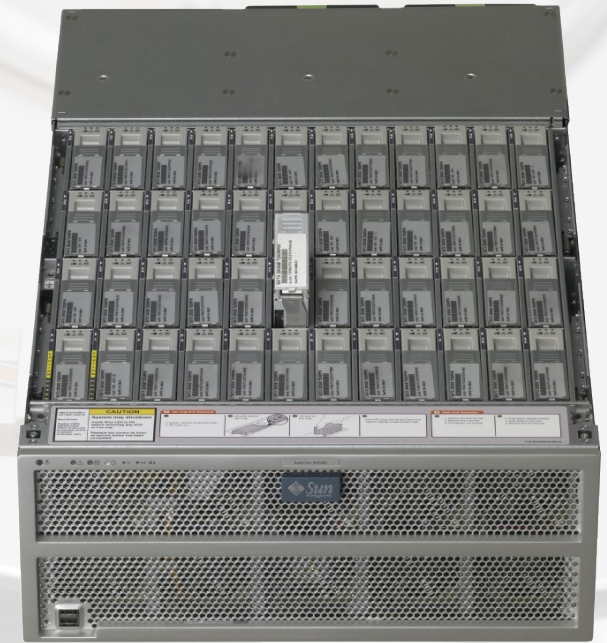
Future: three-tier storage

Fast technology, user-facing store for chaotic access

Large storage on "slow" magnetic disks. Can use cluster filesystem (e.g. HDFS)

Tape library

Streamed as needed

Archiving custodial data

fast pool node

fast pool node

fast pool node

fast pool node

storage pool node

tape-attached pool node

storage pool node

tape-attached pool node

storage pool node

storage pool node

storage pool node

storage pool node

storage pool node

Occasional data recovery

Thank you!

EMI is partially funded by the European Commission under Grant Agreement RI-261611
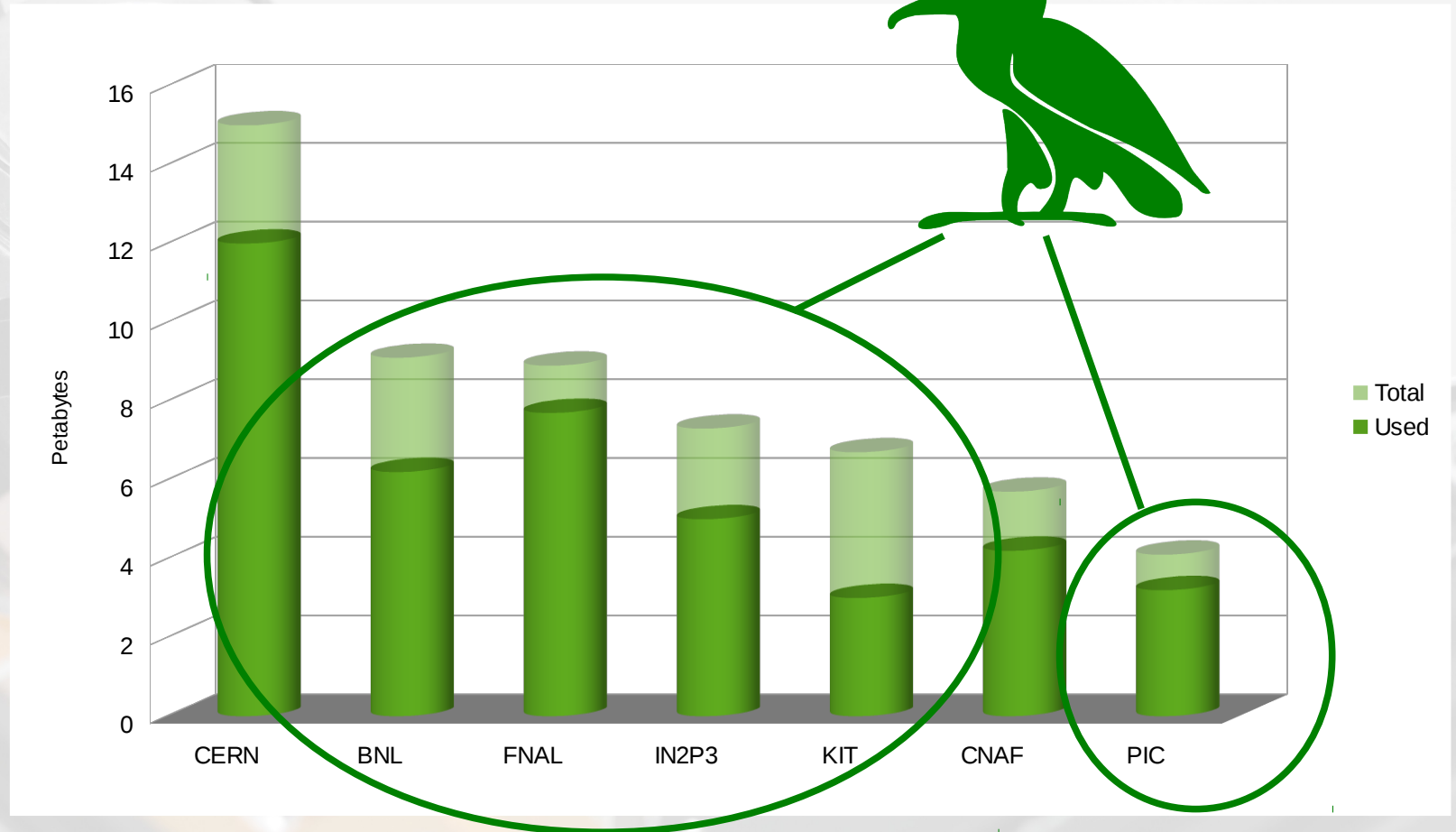
Backup slides

EGI TF 2011: dCache

... advanced storage

- Automatic hot-spot replication

- Redundant storage

- Tape integration

- Scalable storage
  - Largest site *currently* 10 PiB
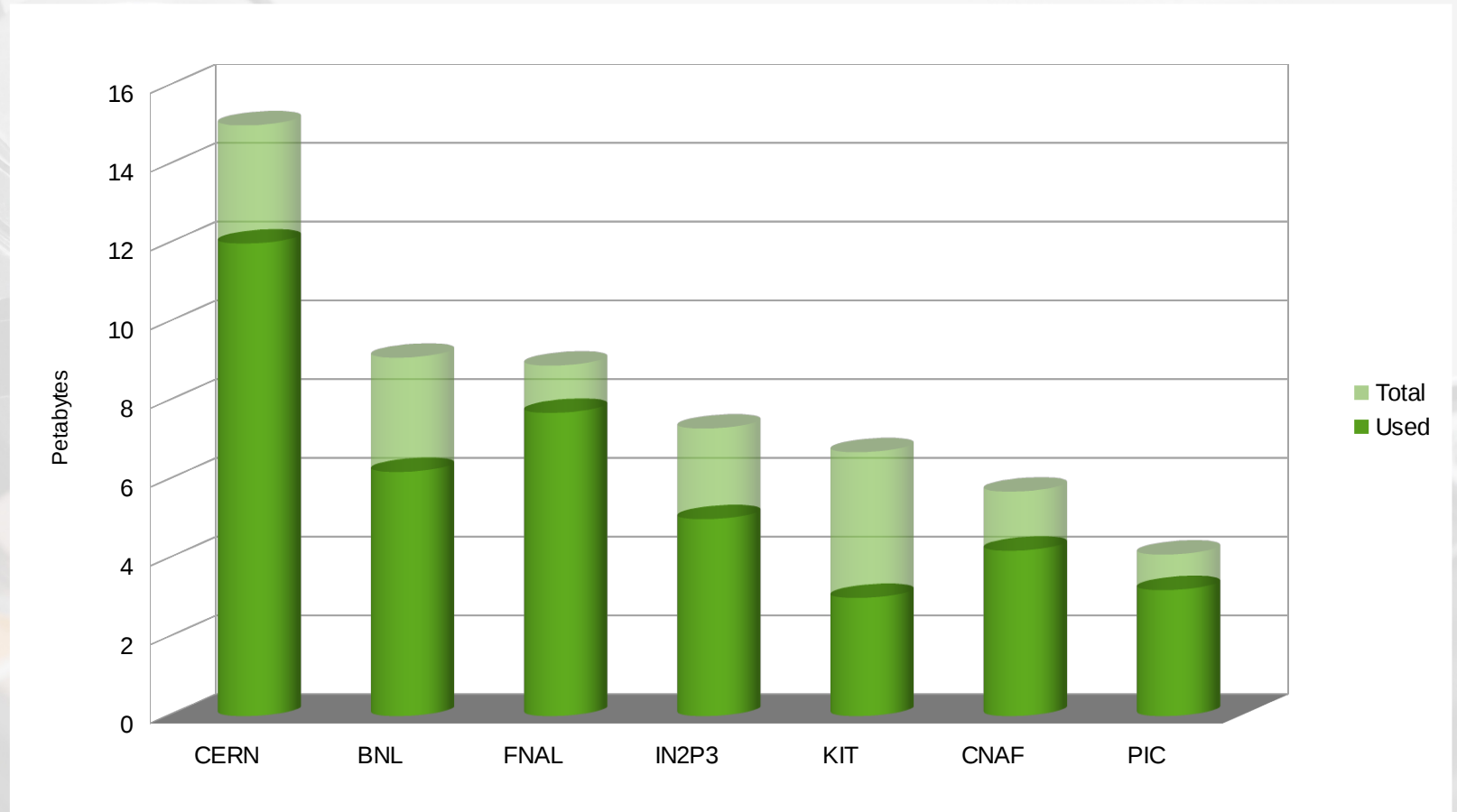
- Fine-grain data placement control
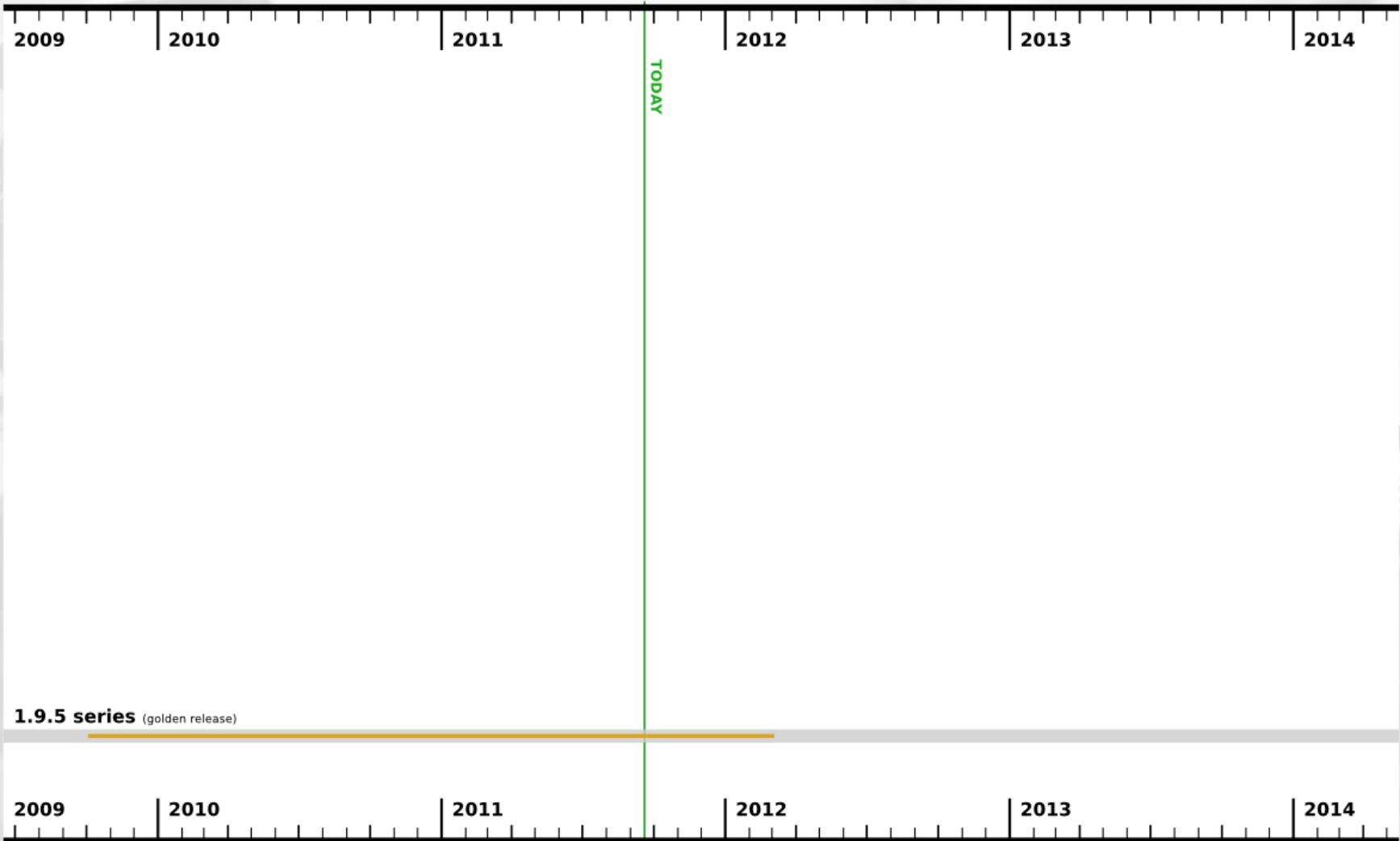
... used by large sites

... standards compliant

Standards
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WLCG site storage capacity

Releases

2009   2010   2011   2012   2013   2014

TODAY

1.9.5 series (golden release)

2009   2010   2011   2012   2013   2014

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Releases

Releases

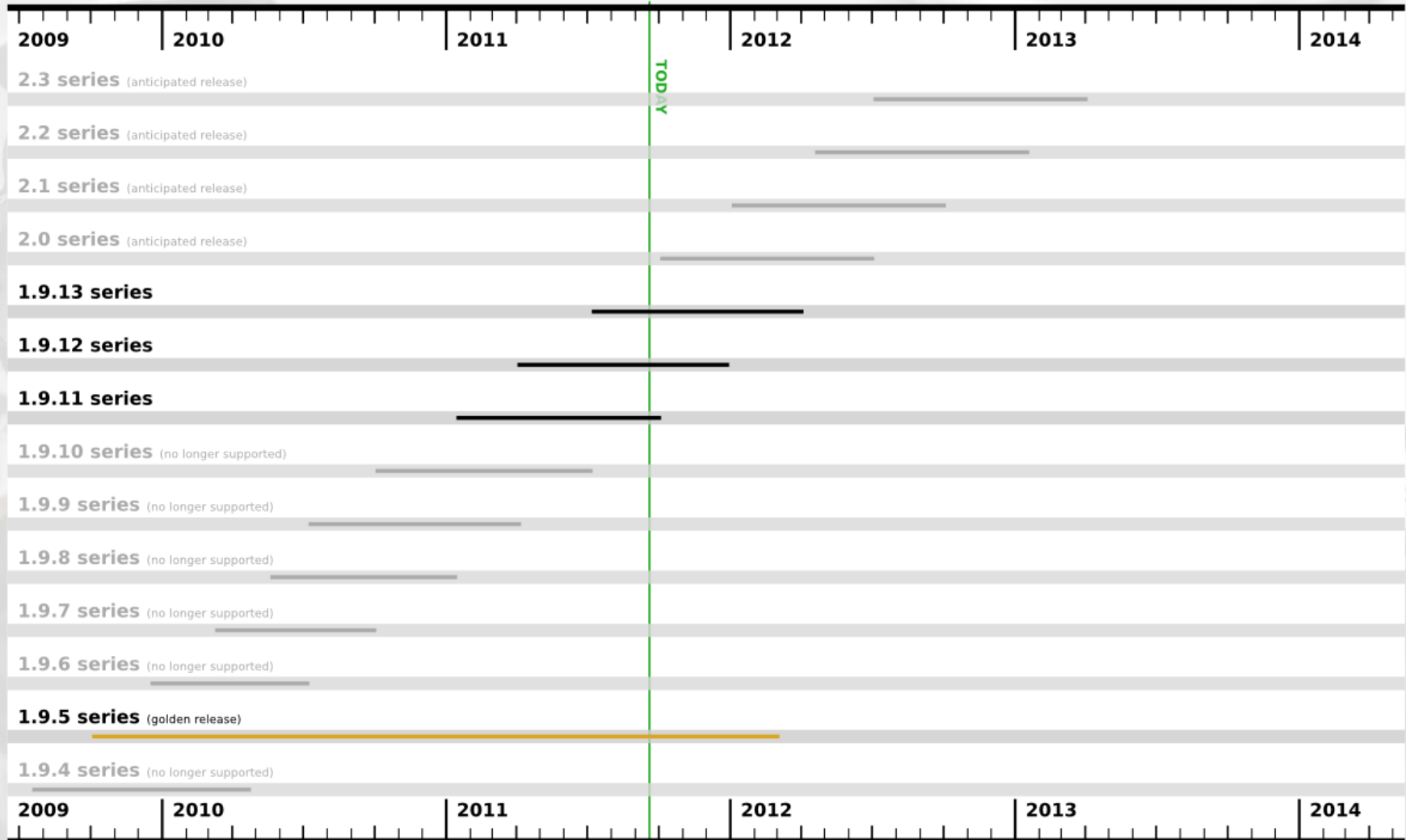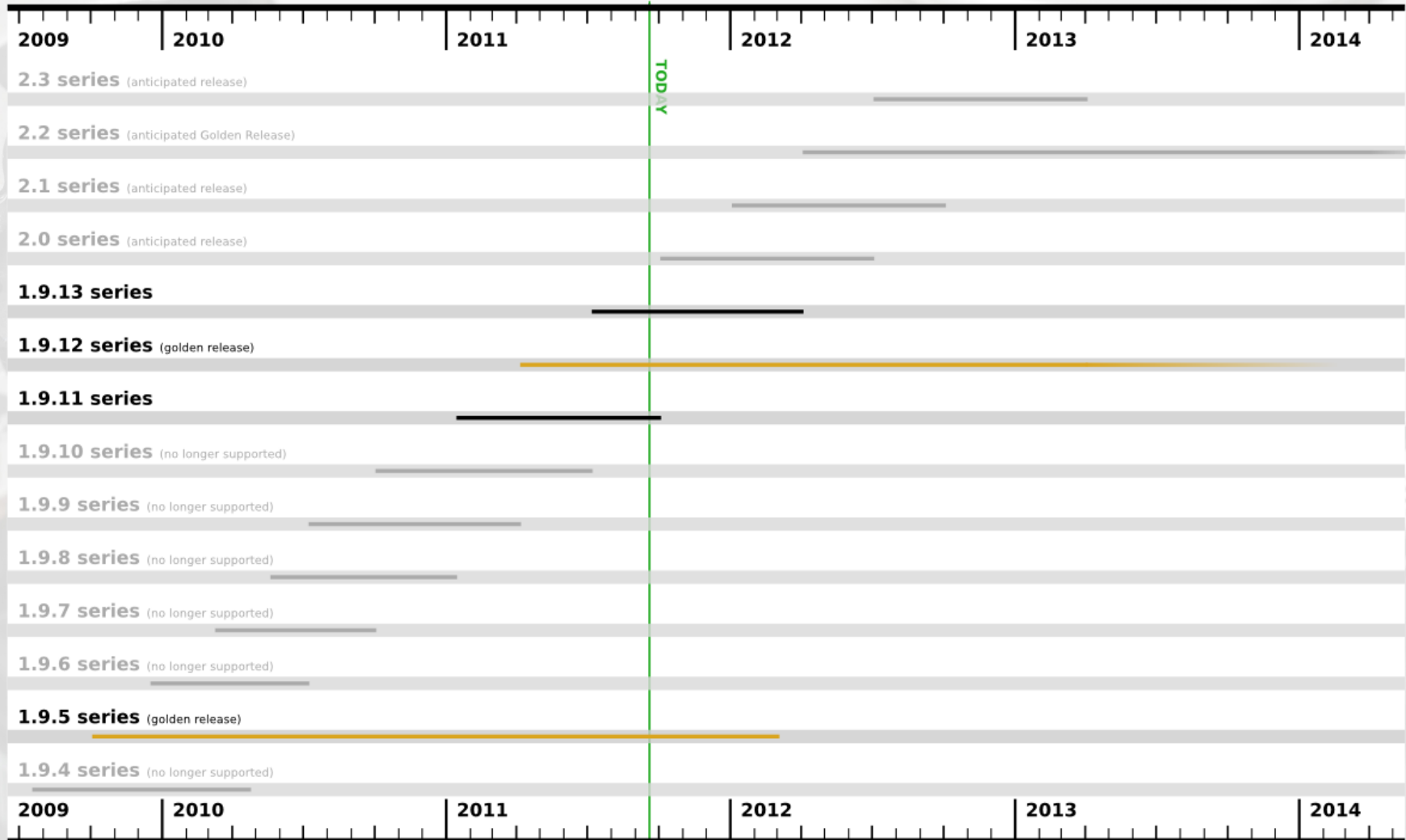# Helping our users

- Actively participating with the xrootd redirector
- Swegrid / national storage fac.

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