

An Year with CTA

Highlights & Experiences

Mwai Karimi, On Behalf of The dCache Collaboration & DESY Tape-Ops
CTA Workshop, 2024

Background

DESY as Storage Provider

EuXFEL, PETRA III, ILC - Tier-0

Belle-II - Tier-1

ATLAS, CMS - Tier-2

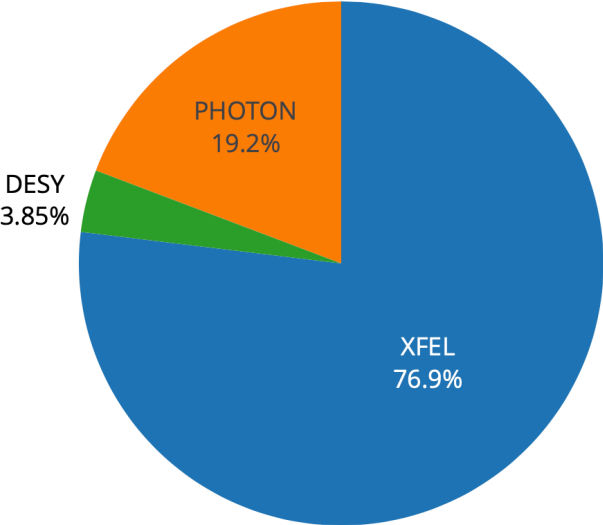
H1, Hermes, Hera-B, Zeus



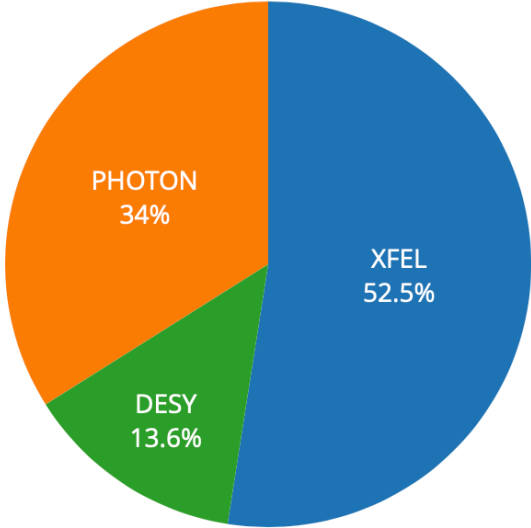
Background

DESY as Storage Provider

% of Nearline Data per dCache Instance



% of Tape Files per dCache Instance



DESY - single copy
PHOTON - 2 tape copies
XFEL - 2 copies i.e disk + tape

Background

Tape Software

OSM

- Tape backend for dCache
- Since 1994
- Proprietary software

Recap

OSM ==> CTA



CTA

- Q4 2021 - dCache-CTA integration
- Q2 2022 - Testing
- Jan 2023 - DESY dCache migration (5PB)
- Production in April 2023 (5.17.14-1)

Migration Status

OSM ==> CTA

Instance Migration Complete

Q3 2023 - XFEL

Q1 2024 - PHOTON

Migration Status

OSM ==> CTA

Data Migration Complete

Q4 2023 - XFEL

- 100PB, 17M files, 124 Tape pools

Q1 2024 - PHOTON

- 25PB, 11M files 114 Tape pools, 3 VOs

New Developments

New Instances

**Additional Instances Configured
for Tape
ATLAS, CMS, M**

New Developments

Hardware Upgrade

Tape Drives

- 8 x LTO9, 6 x TS1160

Library Extension (Frames)

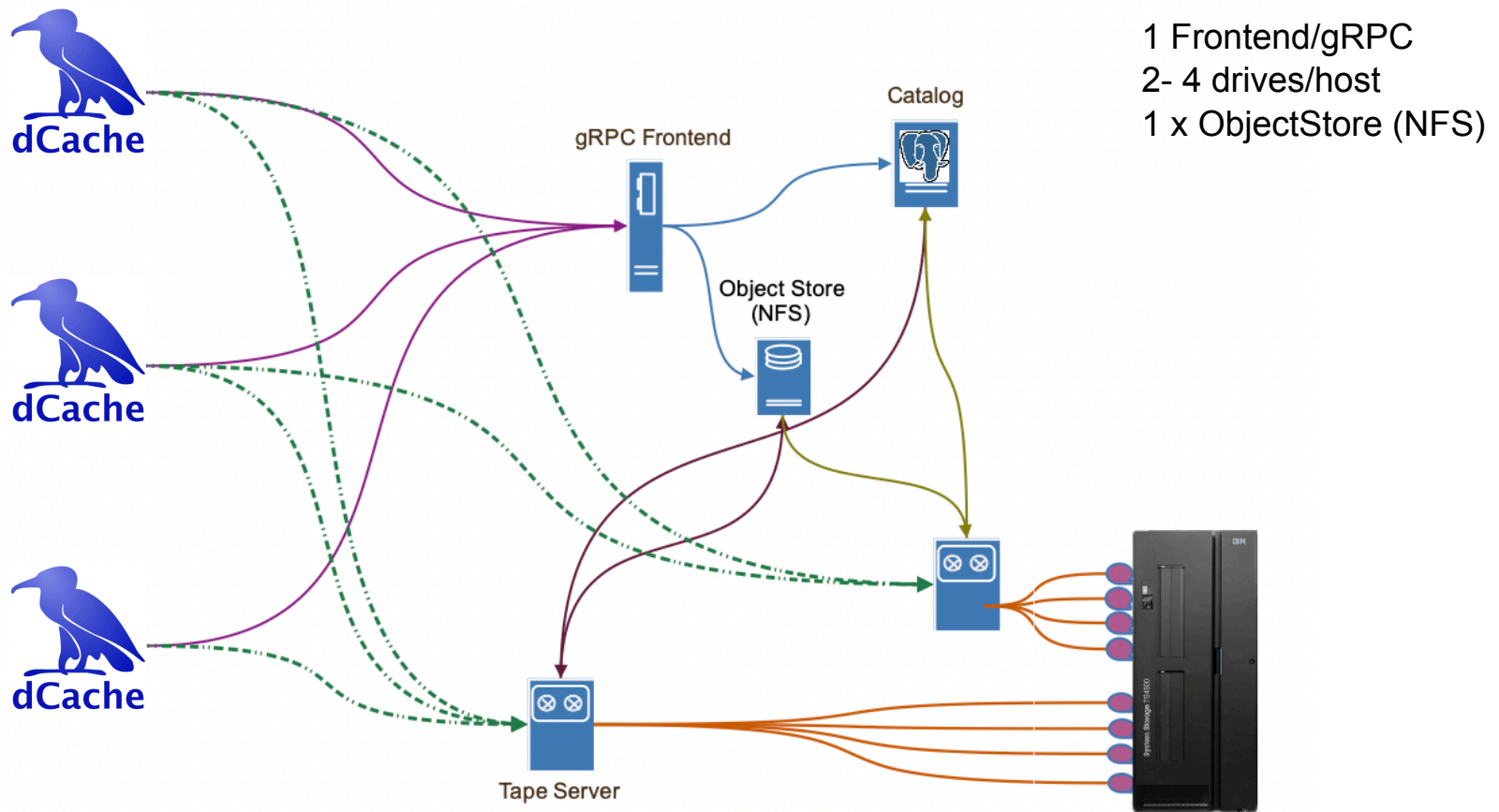
- 1 x Jaguar, 5 x LTO9

6 Tape Servers

ALL- (2 x TS4500, 26 x TS1160, 24 x LTO9)

Deployment

dCache-CTA



CTA Operations

Highlights

Performance OK

~25PB archived

Repacked ~640TB

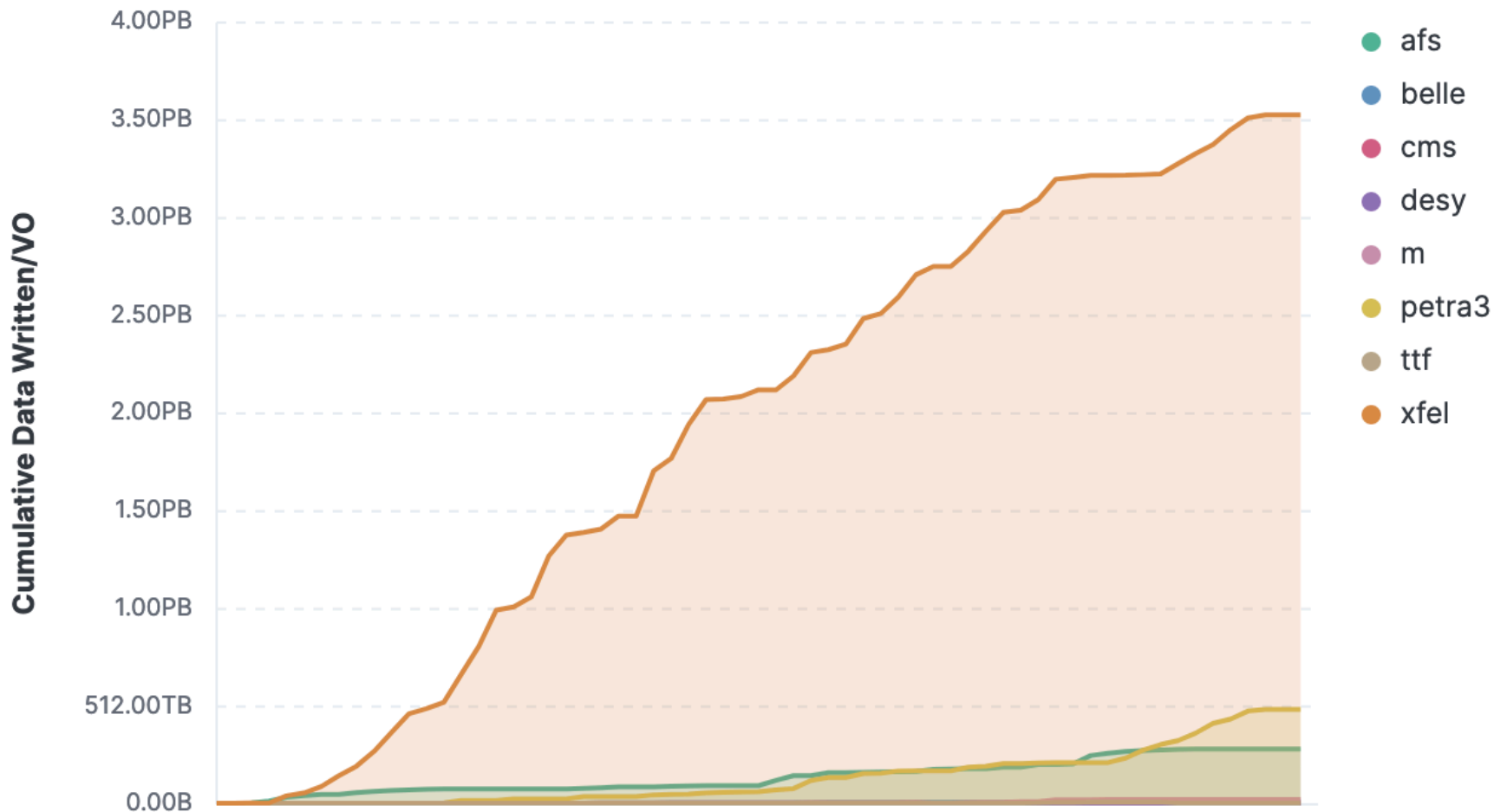
Integration of cta-ops tools to workflow

Extended monitoring

CTA Operations

Highlights

Archived Data



CTA Operations

Issues

STALE Drives

- mitigated by dedicated reporting tape server

Repacking

- sometimes just fails w/o a reason

dCache-CTA Dev

Features, Fixes

dCache-CTA driver

- * [c3b4d28] driver: include CTA archiveId into archiveReportURL
- * [5fa75a1] xroot: handle bad success requests
- * [1e44726] mover: fix transfer URI generation for IPv6
- * [b448e99] xroot: do not send IP addresses in url, if possible
- * [2f04213] driver: don't bind to an interface if io-endpoint is not specified
- * [6799f37] driver: make CTA frontend timeout configurable
- * [3a91ab5] io: calculate IO bandwidth per IO block
- * [8d95987] xroot: add remote peer address into log statements
- * [5bfdfa6] driver: don't flush empty files or files without checksum
- * [fd49790] driver: add restore-success-on-close to control reporting behaviour
- * [3d99040] driver: shortcut zero-byte files
- * [80d5917] drv: convert driver to use sync-rpc

gRPC Frontend

- configurable number of processing threads
- bumped number of open file descriptors

18th Intl. dCache Workshop

Next Steps

Handle dCache resubmits
More monitoring/alarming

Summary

Migration from OSM -> CTA complete

New experiments onboarded

CTA in full swing

dCache-CTA development evolving

Thank you